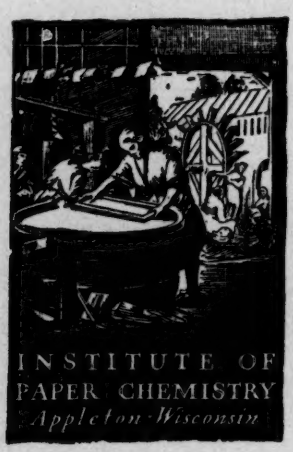
PAGES 831-904

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

AUGUST · 1951

Volume 21 Number 12

THE cut on the cover is a reproduction of the Bookplate of The Institute of Paper Chemistry. The drawing, entitled, "the Papermaker," first appeared in 1698 in the Book of Trade by Christoff Weigel. This particular reproduction has been copied from an illustration appearing on page 43 of Dard Hunter's book "Papermaking Through Eighteen Centuries," published in New York in 1930 by William Edwin Rudge. THE INSTITUTE is greatly indebted to Mr. Hunter for permission to use the illustration.

BULLETIN

of

THE INSTITUTE of PAPER CHEMISTRY

AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

AUGUST • 1951

Volume 21 Number 12

LIBRARY NOTES

The Bulletin of The Institute of Paper Chemistry is published monthly at Appleton, Wisconsin, by the Board of Trustees of The Institute of Paper Chemistry. Entered as Second Class matter November 13, 1930, at the postoffice at Appleton, Wis., under the act of August 24, 1912.

THE INSTITUTE OF PAPER CHEMISTRY

OFFICERS

ERNST MAHLER	Chairman of the Board
D. C. EVEREST	Vice-Chairman of the Board
JOHN L. RIEGEL	Vice-Chairman of the Board
WESTBROOK STEELE	President
JOHN G. STRANGE	Vice-President—Treasurer
C. B. SITTERSON, JR.	Secretary
DORIS PICKERT	Assistant Secretary

BOARD OF TRUSTEES

NATHAN M. PUSEY, President of Lawrence College, ex officio
WESTBROOK STEELE, President of The Institute of Paper Chemistry, ex officio

For the term expiring in 1951

ALEXANDER CALDER, Union Bag & Paper Corporation, New York, N.Y.
SYDNEY FERGUSON, The Mead Corporation, Dayton, Ohio.
ERNST MAHLER, Kimberly-Clark Corporation, Neenah, Wis.
W. IRVING OSBORNE, JR., Cornell Wood Products Company, Chicago, Ill.
KARL E. STANSBURY, Thilmany Pulp and Paper Company, Kaukauna, Wis.

For the term expiring in 1952

D. C. EVEREST, Marathon Corporation, Rothschild, Wis.
DAVID L. LUKE, JR., West Virginia Pulp and Paper Company, New York, N.Y.
HERBERT T. RANDALL, The Champion Paper and Fibre Company, Hamilton, Ohio.
JOHN L. RIEGEL, Riegel Paper Corporation, New York, N.Y.
GEORGE OLMSTED, JR., S. D. Warren Company, Boston, Mass.

For the term expiring in 1953

DAN K. BROWN, Neenah Paper Company, Neenah, Wis.
GEORGE E. DYKE, Robert Gair Company, New York, N.Y.
STUART E. KAY, International Paper Company, New York, N.Y.
A. B. LAYTON, Crown Zellerbach Corporation, San Francisco, Calif.

STANDING COMMITTEES OF THE TRUSTEES

EXECUTIVE COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, George E. Dyke, David L. Luke, Jr., and Karl E. Stansbury.
INVESTMENT COMMITTEE: Ernst Mahler, Chairman; D. K. Brown, John G. Strange, and Ralph J. Watts.
COMMITTEE ON ACADEMIC POLICY: Nathan M. Pusey, Chairman; Rex Hovey, Harry F. Lewis, Ernst Mahler, John L. Riegel, Westbrook Steele, and John G. Strange.

Books and Pamphlets Added to the Library During July

BIOGRAPHY

JACOBUS, DONALD L., comp. The genealogy of the Kimberly family. Printed for James Cheney Kimberly. [Menasha, George Banta Publ. Co.] 1950. 176 p.

BIOLOGICAL LABORATORIES—DIRECTORIES

DIRECTORY of biological laboratories. 5th ed. Chicago, Burns Compiling Research Organization, c1951. 164 p.

CHEMISTRY, MEDICINAL AND PHARMACEUTICAL

MEDICINAL CHEMISTRY, a series of reviews prepared under the auspices of the Division of Medicinal Chemistry of the American Chemical Society. [C. M. Suter, editor-in-chief] New York, Wiley [c1951] v. 1. 473 p.

COLOR

COLOUR; a collection of papers describing investigations in the fields of colour physics and colour psychology carried out in the laboratories of the Dyehouse Department of I.C.I. Dyestuffs Division at Blackley, Manchester, during the period 1940-1948. With a foreword by G. S. J. White. [Manchester] Imperial Chemical Industries Limited, Dyestuffs Division [1950] 120 p.

DIFFUSION

LONGSWORTH, L. G., *and others*. The diffusion of electrolytes and macromolecules in solution. Annals of the New York Academy of Sciences, vol. 46, art. 5. New York, The Academy, 1945. p. 209-346.

LIBRARY SCIENCE

JACKSON, LUCILLE, ed. Technical libraries, their organization and management. Special Libraries Association. Science-Technology Division. New York, The Association [c1951] 202 p.

MATERIAL HANDLING

BARRY, JACK K., *and Associates*. Paper handling practices. Madawaska, Maine, Fraser Paper, Limited, 1951. 74 p.

NEWSPRINT

U. S. TARIFF COMMISSION. Newsprint. War changes in industry series report no. 22, revised. Washington, U. S. Govt. Print. Off., 1951. 46 p.

PAPER MAKING AND TRADE

KIRCHNER, ULRICH, ed. Ratgeber für den Betrieb von Papier-, Pappen-, Zellulose-, Holzstoff- und Strohstoff-Fabriken. 2., neu bearb. Aufl. Biberach an der Riss, Im Selbstverlag des Herausgebers [c1942] 484 p.

PATENTS

VAN DER WERTH, A., comp. Die ab 1943 noch bekannt gegebenen deutschen Patente für die Klasse 55 (Vorbereitung der Rohstoffe, Verfahren und Vorrichtungen zur Erzeugung von Zellstoff, Holzschliff, Papier und Pappe). Schriften des Vereins der Zellstoff- und Papier-Chemiker und -Ingenieure, Band 23. Aschaffenburg, Verlagsanstalt Dr. J. Kirsch, 1950. 56 p.

PECTIN

KERTESZ, Z. I. The pectic substances. New York, Interscience Publishers, 1951. 628 p.

PLASTIC MATERIALS

BRITISH PLASTICS year book, 1951; a classified guide to the plastics industry. 21st year of publication. London, Iliffe & Sons Ltd., 1951. 435 p.

DEUTSCHES JAHRBUCH für die Industrie der plastischen Massen 1945/1950; ein praktisches Nachschlagewerk über den derzeitigen Stand der Industrie. [6. Ausgabe] Herausgegeben von Karl Fabel. Berlin, Wilhelm Pansegrau Verlag [1951] 472 p.

WOOD

KOLLMANN, FRANZ. Technologie des Holzes und der Holzwerkstoffe. 2. neubearb. u. erw. Aufl. Berlin, etc., Springer-Verlag, 1951. 1. Band. Anatomie und Pathologie, Chemie, Physik, Elastizität und Festigkeit. 1050 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABSORPTION SPECTRA

BROWN, L., HOLLIDAY, P., and TROTTER, I. F. The absorption spectra of some cellulose derivatives in the 3-μ region. J. Chem. Soc.: 1532-9 (June, 1951).

The infrared absorption spectra of native and regenerated cellulose and of a number of cellulose derivatives have been measured in the region of 2.5-4.0 μ. The results show that the shape and frequency of the absorption band associated with the fundamental hydroxyl-stretching mode give considerable information about the hydrogen-bonding conditions, and in particular may be used as a criterion of uniformity of substitution along the cellulose chains. The possibility of using the intensity of the hydroxyl band as a measure of the hydroxyl content of cellulose derivatives is discussed. Preliminary infrared measurements are described on the water imbibition of some cellulose ethers and esters. 4 figures. E.S.

ADHESIVES

LENZ, EARL C. Answers to typical packaging questions. Packaging Parade 19, no. 222: 90-2 (July, 1951).

In a series of questions and answers, some adhesive problems involved in the labeling of bottles and jars are discussed under the following headings: bottle labeling considerations, adhesive selection and application, preparation of adhesive for use, and conditions during operation. M.W.

SHOLD, K. M. Seam adhesives for multiwall bags. Tappi 34, no. 7: 294-6 (July, 1951).

The successful manufacture of multiwall bags is dependent to a large extent on the use of proper seam adhesives. These seam adhesives fall into three main classifications: (1) standard seam adhesives, (2) water-resistant seam adhesives, and (3) waterproof seam adhesives. The selection of the best adhesive for each classification involves consideration of physical, chemical, and psychological factors. The choice of a particular adhesive for each classification is often limited by the type of paper involved and by the effect of heat on the adhesive bond. 2 references. E.S.

ALKALINE PROCESSES—FURNACES

GRAFF, R. M. Maintenance problems of the recovery furnace room. Paper Mill News 74, no. 28: 99-100, 102, 159 (July 14, 1951); Pulp & Paper 25, no. 8: 62 (not complete) (July, 1951).

The main changes made during the past few years in the design of the black liquor recovery furnace are discussed, with special emphasis on the effect of these changes on the maintenance of the recovery unit, including firebox, dissolving tank and auxiliary equipment, boiler and soot blowers, air heaters, cascade evaporator, and fans. The problems and their solution are principally those encountered at the Longview Fibre Co. A thorough,

periodic inspection of all furnace equipment will help to hold the necessary shutdowns to a minimum. E.S.

ALKALINE PROCESSES—RECOVERY

VANCE, HARRY W. New recovery boiler for New York & Pennsylvania Company. Paper Mill News 74, no. 30: 8, 16 (July 28, 1951).

A brief description of the new 150-ton soda recovery boiler at the Clarion mill, Johnsonburg, Pa. is given; the new unit will burn the combustibles in the black liquor and generate 84,500 pounds of steam per hour. The flue gases pass through a Cottrell electrical precipitator equipped with a wet bottom, which is a new development and the third installation of its kind in the paper industry. The collected dust falls into approximately 12 inches of liquor and is dissolved or carried in suspension. The liquor in the wet bottom is circulated by a motor-driven, blade-type agitator to facilitate solution and prevent the building up of solids in the bottom, and is continuously delivered to the smelt tank. E.S.

ALPHA PULP

ENGELMANN, HERMANN. The differential behavior of cotton linters and chemical wood pulps on acetylation. Das Papier 5, no. 9: 149-55 (May, 1951). [In German]

Cotton, softwoods, hardwoods, and grasses differ essentially in their chemical and morphological structure. They are changed extensively by pulping and purification procedures; however, certain impurities exist in the purified celluloses as well as in the original materials, notably pentosans, uronic acids, and calcium. These are also present in the acetate after acetylation and are shown to be concentrated in the fraction which is precipitated first (I) upon the addition of a nonsolvent. They are evidently responsible for the haze in acetates. The acetone solutions of acetates produced from wood and straw pulps exhibit higher viscosities than expected at high concentrations. This effect is accentuated in the (I) fraction and seems to be related to the impurities. A study of the viscosity-pressure relationship shows that the high viscosities are due to association in solution. Solutions in methylene chloride, which is evidently a better solvent, exhibit viscosities in accordance with the D.P., and the solutions are less hazy. To free the wood celluloses from impurities, it is necessary to resort to drastic treatments which produce large amounts of low chain-length material and, consequently, affect the acetates adversely. The hypothesis is advanced that the impurities exist with cellulose as a mixed chain; calcium may be bonded to uronic acid groups in cellulose by means of salt bridges. 4 tables, 5 figures, and 18 references. K.E.B.

HESCOCK, M. A. Dissolving and specialty pulps. Tappi 34, no. 7: 76A, 78A, 80A (July, 1951).

Following a brief description of the manufacture of refined sulfite pulp from wood, the author discusses different sulfite and sulfate high-alpha wood pulps manufactured by the Brown Co., including Dur Sylvan, Dur Natus, Dur-Alba, Cellate, Durakraft, Solka, and Solka-Floc, as well as their principal applications. E.S.

ASSOCIATIONS

VAN NEDERVEEN, G. International co-operation of technical men in the paper industry. Papierwereld 5, no. 6: 244-6 (January, 1951); Das Papier 5, no. 10: 217-18 (May, 1951). [In Dutch and German]

The possibilities for international co-operation between the different technical associations of the pulp and paper industry in Europe are discussed; this is at the present time considered preferable to the creation of an international organization in which the different countries would be represented. E.S.

BARKERS AND BARKING

JOHNSON, MEDER. Recent developments in hydraulic barking. Paper Mill News 74, no. 28: 131-2, 159 (July 14, 1951); Paper Trade J. 133, no. 2: 75-6 (July 13, 1951); Southern Pulp Paper Manuf. 14, no. 7: 30, 32, 36 (July, 1951); Pulp & Paper 25, no. 8: 60, 62 (July, 1951); *cf.* B.I.P.C. 20: 628-9.

The author discusses the construction of the Hansel ring barker, the Simons rotary head barker ("lawn-sprinkler type"), the Bellingham-type barker, the Stetson-Ross barker, and its variation, the oscillating ring barker, and recent installations. The most significant trend in hydraulic barking has been the installation of barkers in sawmills, with the result that the waste wood is bark-free and usable as pulpwood. Chips and barked wood are in great demand and sell at a price that makes the installation of barking equipment in sawmills very attractive. E.S.

STEGMANN, GÜNTHER. Debarking standing trees with chemicals. Das Papier 5, no. 9: 162-4 (May, 1951). [In German] *cf.* B.I.P.C. 20: 232.

A review of North American, principally Canadian, practice is presented. 10 references. E.S.

BIRCH

JOHNSSON, HELGE. Progeny tests with birch; preliminary results from experiments with young plantations. Svensk Papperstidn. 54, no. 11: 379-93; no. 12: 412-26 (June 15, 30, 1951). [In Swedish; English summary]

A detailed account is presented of growth developments of crosses between different birch species in young plantations (three to nine years old) in southern Sweden. The conclusion is drawn that the growth during the first years does not give reliable information about the future development of the trees, but that results obtained with birch in the period between five and 10 years of age may give definite indications. 27 tables, 27 figures, and 18 references. E.S.

BLACK LIQUOR

HEDLUND, INGVAR. The viscosity of concentrated sulfate black liquor at high temperatures. Svensk Papperstidn. 54, no. 12: 408-11 (June 30, 1951). [In Swedish; English and German summaries] *cf.* B.I.P.C. 20: 354-5.

The viscosity of sulfate black liquors from two different Swedish mills (Obbola with a typical sulfate black liquor and Skoghallsverken with a higher than usual content of inorganic matter in the black liquor) has been studied at temperatures as high as 200°C. and concentrations up to 65%. A difference in the viscosity of the liquors was found to exist at the same concentration, which was particularly noticeable at the lower temperatures and which resulted from the difference in the amount of inorganic solids present in the two liquors. 2 tables, 3 figures, and 3 references. E.S.

BOARD—COATED

GALLAGHER, W. C., and SHERMAN, R. A. A new method for coloring paperboard. Fibre Containers 36, no. 7: 24, 26 (July, 1951).

By using a new color formulation and new principles in application machinery, a new process for coloring paperboard at low cost has been developed. In the coating formula, less clay than starch on a solids basis and an extremely high water content are used; to reduce bleeding of the color and impart a suitable degree of water resistance, a small amount of water-soluble urea-formaldehyde resin is introduced which is catalyzed with an acid salt and heat. The equipment for applying a color dispersion consists of a combination of a wire-wrapped rod and a special support roll containing a device for cleaning the wire. In operation, a web of paperboard from a feed roll passes over one or more guide rolls past an applicator device which deposits an excess of coating just ahead of the wire-wrapped smoothing rod. This rod spreads the coating uniformly at a thickness depending, in part, on the diameter of the wire used on the smoothing roll. It is essential that this coating rod be driven reversibly with respect to the direction of the web movement; a variable-speed drive should be used to provide accurate control of the coating-film thickness. The speed and diameter of the wire-wrapped rod are of great importance in obtaining maximum efficiency in operation. The application of the coating color is not limited to this equipment, although it is recommended because of the simplicity of its operation. When properly formulated, the coating color can also be applied by engraved rolls and various other simple printing devices used in the paperboard industry. The use of the wire-wrapped roll, however, will completely eliminate the pattern condition, referred to in the trade as "crawling" or "orange peel." A typical formula is included. Drying should be carried out as soon as possible after the color has been applied; this is usually done by carrying the sheet around a drum-type drier placed immediately after the applicator rod. 2 figures.

E.S.

BOARD—CONVERSION

ANON. Hankins new Elmira plant. Fibre Containers 36, no. 7: 46, 50 (July, 1951).

Brief reference is made to the opening of the new one-story plant of Hankins Container Co. at Elmira Heights, N.Y., including a 76-inch Swift corrugator and facilities for boxmaking. 6 illustrations of the plant and equipment.

E.S.

BOARD MILLS

ANON. Sonoco to establish plant in Mexico. Southern Pulp Paper Manuf. 14, no. 7: 40-1, 60 (July, 1951).

A brief description of the plant of Sonoco Products Co. is given, which is now under construction on the Laredo Highway, 10 miles north of Mexico City. The plant will manufacture cones, tubes, and a complete line of specialties for the Mexican textiles industry from waste paper; board will also be sold to other converters. The machinery will include two Hydrapulpers and one paper machine.

E.S.

WOLFE, WALTER F. What we have done to remain competitive. Paper Mill News 74, no. 28: 120, 161 (July 14, 1951); Paper Trade J. 133, no. 2: 73-4 (July 13, 1951); Southern Pulp Paper Manuf. 14, no. 7: 36, 38 (July, 1951).

Some of the steps taken by the Mac Sim Bar Paper Co., Otsego, Mich. to improve quality, increase production, and reduce cost include mechanized material handling wherever possible, the replacement of beaters by Hydrapulpers, the complete revamping of the two cylinder machines with increase in speed, the installation of Champion coating units, the institution of a quality control system, the installation of an electrical caliper control unit, and a system of preventive maintenance. E.S.

BOARD SIZING

SASS, OTTO. Asphalt for sizing in paperboard. Pulp & Paper 25, no. 8: 90-1 (July, 1951).

In the manufacture of V-boxes during the war two general types of asphalt emulsion were used, one of which had soap as the emulsifying agent, and the other bentonite clay. The author discusses the advantages to be gained from clay-type asphalt emulsions as sizing agents, particularly in hard-sized grades, where the darkening of the sheet is not an objectionable feature. Such emulsions cause no foam in the system and, when used together with rosin size, act as foam killers. Alum concentrations can also be reduced; the results are an improved sheet and higher production rates. 3 references. E.S.

BOARD TESTING—PHYSICAL

ROOT, CARLETON. Theoretical and actual qualities of corrugated board. Tappi 34, no. 7: 22A, 24A; discussion: 24A (July, 1951).

Following a brief discussion of the suitability of conventional tests of corrugated board (bursting strength, flat crush, and tube compression), reference is made to the possibility of treating fiberboard as an engineering material and fiberboard containers as engineering structures which lend themselves to treatment by engineering methods. It has been found possible to obtain moduli of elasticity of component materials and to use this information in the computation of maximum load of tubes; this work is also extended to boxes. Other properties in the finished container are fatigue strength and creep; work on the determination of these properties is in progress at The Institute of Paper Chemistry. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Standard drainage time of pulp for insulating board. Tappi 34, no. 7: 120-2A (July, 1951).

The text of TAPPI Suggested Method T 1002 sm-51 is presented; it describes a method for the measurement of the drainage time of coarse, easily dewatered, insulating-board pulps, including the design of a specially constructed apparatus, test specimen, procedure, and method of reporting. 1 diagram. E.S.

WILCOX, HUGH. The effects of machine head speed and specimen span on modulus of rupture values obtained in static bending tests of a nominal 5/32-inch Douglas-fir hardboard. Tappi 34, no. 7: 314-16 (July, 1951).

Modulus of rupture values in static bending tests of a nominal 5/32-inch Douglas-fir hardboard were determined for 30 combinations of machine-head speed and specimen span. Results indicate that the employment of unit rates of extreme fiber strain considerably in excess of those currently recommended for evaluating fiberboard produces plateaus wherein the modulus of rupture values are virtually constant throughout a relatively wide range of

head speeds. The use of greater head speeds suggests that modulus of rupture values so obtained may be adjusted to any arbitrary base for the purpose of comparing the results of different investigators, and that testing time may be shortened materially. 4 figures and 5 references. E.S.

BUSINESS FORECASTING

SALTFORD, GEO. W. Forecasting production improves operations. Paper Ind. 33, no. 4: 406-7 (July, 1951).

Long-range planning for management should be based on the sales forecast and then be converted into terms of the physical facilities needed for production. Forecast data can be extended in two ways—in terms of direct material requirements and in terms of machine utilization. The sales forecast should be projected as far in advance as pulp requirements dictate. Details of the machine-loading and material-requirements forecasts are explained, supplemented by two sample charts. Once these requirements are established, accurate financial planning is possible. Manufacturing costs, including overhead, can be computed from materials costs and running rates for the machines. Forecast sales less costs foretell profit. The consideration of anticipated profit, when related to the existing financial position, provides the foundation for executive decisions which constitute the plan for the future. A periodic amendment of the plan to meet business trends is recommended. 2 tables. E.S.

CELLULOSE—SOLUBILITY

JAYME, GEORG. A new water-soluble cellulose complex. Das Papier 5, no. 11/12: 244-51 (June, 1951). [In German]

Traube (*cf.* Ber. 49: 3319-24 [1911]) found that the ammonium in Schweitzer's reagent can be replaced by other amines; he also tried, although without success, to substitute other metals for copper in the cellulose-cuprammonium complex. In the case of cobalt he concluded that it is not possible to obtain cobalt-ethylenediamine-cellulose solutions by direct treatment of the cellulose with cobaltous or cobaltic ethylenediamine. The results of the present study, however, show that this is possible if certain precautions are observed. A reactive blue cobaltous hydroxide dispersed in layers must be prepared and, while still in moist condition, be dissolved in 50-55% ethylenediamine; the solution has a deep wine-red color. Oxygen must be carefully excluded and sufficient ethylenediamine used so that no precipitation of the crystallized modification of cobaltous hydroxide or of the pink-colored hydroxide takes place. Solutions richer in cobalt may be obtained by the addition of tartaric acid or glycerin, substances which favor the formation of the blue hydroxide and suppress the precipitation of the pink modification. In this manner solutions may be obtained which consist, for instance, of 6.8% cobalt, 26.6% ethylenediamine, and 1.7% glycerin (all percentages on a weight basis). In these solutions cellulose, even in the impure form of a non-purified rayon pulp, may be dissolved to concentrations of up to approximately 7% of organic substance; they are also colored a deep wine-red, and are clear and highly viscous. The author assumes that for the aqueous cobalt-amine complex the formula $[Co(en)_3](OH)_3$, and for the cellulose complex, the formula $[C_6H_7O_6Co]_3[Co(en)_3]$ holds. A patent application which covers the procedure has been made. 3 tables and 14 references. E.S.

CELLULOSE ETHERS

VAUGHN, T. H., and KRAMER, M. G. Detergency properties of sodium carboxymethyl cellulose-soap-builder systems. J. Am. Oil Chemists' Soc. 28, no. 7: 317-19 (July, 1951); *cf.* B.I.P.C. 20: 308-9.

Data are presented which illustrate the detergency properties of sodium carboxymethylcellulose-soap-builder systems. Practical considerations limit the use of sodium carboxymethylcellulose to the lower concentrations, and it is shown that at a concentration of 5%, builder tolerance is increased without sacrifice in soil-removal properties. At concentrations above 3%, the soil-removal properties of the system increased above that of soap alone, except in the case of very high builder content. Whiteness-retention properties of common soap and unbuilt soap were increased by the addition of sodium carboxymethylcellulose, as were the soil-removal properties of unbuilt soap. 5 figures and 4 references. M.W.

CHEMICAL TESTING—BLACK LIQUOR

WRIGHT, R. H., SCHOENING, M. A., and HAYWARD, A. M. The colorimetric determination of hydrogen sulphide and methyl mercaptan in sulphate pulp mill effluents and of sodium sulphide in black liquor. Tappi 34, no. 7: 289-94 (July, 1951).

A colorimetric method for the determination of hydrogen sulfide and methyl mercaptan has been based on their reactions with Bindschedler's green to form methylene blue and a pink substance, respectively. Mercaptan does not seriously interfere with the determination of hydrogen sulfide. Interference of hydrogen sulfide in the determination of methyl mercaptan is prevented by adding cadmium chloride to the reagent and filtering before developing the color. A convenient absorption apparatus is described for sampling gaseous effluents. For the colorimetric determination of sodium sulfide in black liquor, adsorption of methylene blue by precipitated black liquor solids can be prevented by adding a suitable cationic wetting agent to the reagent. 8 figures and 6 references. E.S.

CHEMICAL TESTING—CELLULOSE

POLJAK, A. Wood decomposition with peracetic acid. II. Determination of cellulose by means of peracetic acid. Holzforschung 5, no. 2: 31-3 (1951). [In German] *cf.* B.I.P.C. 19: 389-90.

Air-dried wood (2 g.) was heated with 10 ml. of 10% peracetic acid (I) in a boiling water bath exactly 30 minutes after the temperature of the mixture had reached 75°C. The solution was diluted with 100 ml. of water, filtered, and washed successively with one liter of water at 50° and several portions of acetone and alcohol (1:1) and dried. This technique produced the following yields of cellulose: beech, 58.3%; oak, 51.9%; fir, 58.6%; and pine, 55.6%. Kinetic studies showed that the reaction between a wood and (I) was complete within 0.5 hour, and that the resulting cellulose was free from lignin. Colorimetric determinations of the phenolic bodies (II) which appeared after varying time intervals in the filtrates from cellulose were made by coupling these with diazotized sulfanilic acid. The method is described fully. The author concludes that (II) occur in the form of glycosides, and that they are derivatives or components of lignin. Only one type of (II) was obtained from beech, whereas three different entities were removed from firwood at different rates. The glycosides could then be hydrolyzed to the appropriate sugar and determined by Bertrand's method. 2 figures and 2 references. L.E.W.

CHEMICAL TESTING—PULP—CUPRAMMONIUM VISCOSITY

CALVERT, M. A., and CLIBBENS, D. A. The relation between the viscosity and concentration of cellulose solutions in cuprammonium; and the calculation of the intrinsic viscosity of cellulose. J. Textile Inst. 42, no. 6: T211-34 (June, 1951).

New experimental data are presented on the relation between the viscosity and concentration of solutions of cellulose in cuprammonium. The range of relative viscosity examined extends up to 100, but particular attention is paid to the range between 1.5 and 10. The materials used are chiefly scoured cottons modified to different extents by acidic or oxidative degradation. They cover an approximately tenfold range of intrinsic viscosity, or of molecular weight if the latter is assumed proportional to intrinsic viscosity. The equations proposed to represent the dependence of viscosity on concentration by Baker; Farrow and Neale; de Jong, Kruyt, and Lens; a modification of the last proposed by Martin; and the equation of Schulz and Blaschke, are examined both in general and in relation to the accuracy with which they represent the data. All these equations are capable of satisfying the data in certain different ranges of relative viscosity, but they are not equally valid for the calculation of intrinsic viscosity. In order to fit the experimental results in a range of relative viscosities from 1.5 to 10, which is a common working range, an exponent in the Baker equation of about 3.5 is required, instead of the generally employed 8. The numerical constant in Farrow and Neale's equation must also be considerably lower than the value of 11 originally assigned to it. The equation of de Jong, Kruyt, and Lens, with two unknown constants, fits the data well over the whole range of relative viscosity up to 100. The modification suggested by Martin, which reduces the two unknown constants to one, also represents the data fairly well over the whole range with a single numerical constant (0.14). An approximate equation is suggested which facilitates the calculation of fluidities at a standard concentration of the solute from experimental measurements made at a slightly different concentration. 8 tables, 4 figures, and 19 references. E.S.

CHLORINE

STENERSON, HARRY. Behind the markets. Chem. Eng. News 29, no. 28: 2868 (July 9, 1951).

Approved new facilities for the production of chlorine will add 3100 tons to the nation's daily capacity. Most of the added capacity will be produced by the electrolytic process with caustic soda as a co-product. Since the growth of caustic soda consumption is proceeding at a substantially slower rate than that of chlorine, an overproduction of caustic is predicted in the near future. Possible means of reducing the production of caustic by converting it to soda ash, sodium nitrate, sodium sulfate, or elemental sodium are considered, although it is pointed out that there is no immediate solution of the problem. 1 figure. M.W.

CHROMATOGRAPHY

SMITH, TORE H. Chromatographic methods and their application to cellulose chemistry. Norsk Skogind. 5, no. 5: 141-4, 146-8 (May, 1951). [In Norwegian; English summary]

A general review of the techniques and applications of chromatography is presented, with particular reference to the analysis of sugars and sugar derivatives. In conclusion, a brief reference is made to recent results obtained in studies of the polysaccharides from bagasse and birchwood to demonstrate the applicability of the method to current problems in cellulose chemistry. 2 tables, 6 figures, and 14 references. E.S.

SUNDMAN, JACOBUS, SAARNIO, JOUKO, and GUSTAFSSON, CHARLEY. The carbohydrates in wood pulp. Paper and Timber (Finland) 33, no. 4a: 115-21 (Special issue, April, 1951). [In English]

The carbohydrate composition of 20 different pulps was determined by quantitative paper-partition chromatography. Details of the hydrolysis of the pulps, separation of the sugars on Whatman No. 1 filter paper, and their quantitative determination are given in full. Special stress is laid on the destruction of sugars in the hydrolysis preceding the chromatographic separation. Control experiments showed unequal degradation of sugars in the sulfuric acid hydrolysis; the loss of the pentoses was much greater than that of hexoses. In addition, pentosans were found to be more sensitive to epimerization. The pulps studied included unbleached kraft and bleached and unbleached sulfite pulps of spruce, pine, aspen, and birch. In each case, the percentages of pentosan on lignin-free pulp (calculated from liberated furfural), glucosan (100%—% mannan + % xylan), mannan, and xylan were determined and on the unbleached pulps, also the Tingle number. It was noted that xylan content is little influenced by the cooking degree in softwood pulps, but decreases in hardwood pulps on prolonged digestion. The mannan content of softwood pulps amounted to 6-8% with pine pulps, approximately 1% higher than with spruce, and in hardwood pulps varied from 1.4 to 2.5%. Normal bleaching, or cooking degree, affected the mannan content in sulfite or sulfate pulps only negligibly. The investigators concluded that the carbohydrate composition varies considerably, depending on the raw material and method of preparation. 8 tables and 17 references. R.C.R.

CLAY

CLARK, N. O., and BOOTH, R. J. China clay and paper. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 89-99; discussion: 100-6 (February, 1951).

The authors discuss the effect of particle size of clay used in papermaking (color, opacity, viscosity when mixed with water, and abrasion) and some of the instruments used in the determination of these properties. 2 tables and 14 figures. E.S.

COLORIMETRY

AMERICAN STANDARDS ASSOCIATION. American standard methods of measuring and specifying color. J. Optical Soc. Am. 41, no. 7: 431-9 (July, 1951); *cf.* B.I.P.C. 21: 692.

The full text of the three American Standards Z58.7.1-1951 (method of spectrophotometric measurement of color), Z58.7.2-1951 (method for determination of color specifications), and Z58.7.3-1951 (alternative methods for expressing color specifications) is presented. 4 tables, 2 figures, and 6 references. E.S.

CONTINUOUS COOKING PROCESS

CHRISTENSON, TYKE. Continuous cooking and washing of sulfate pulp. Norsk Skogind. 5, no. 5: 133-7 (May, 1951). [In Swedish; English summary]

The Swedish sulfate mill Fengersfors Bruks AB has installed new continuous cooking and washing machinery. The installations were built by AB Kamyr, Karlstad, and the new mill started operations in the fall of 1950. The continuous cooking system was developed by J. Richter (*cf.* B.I.P.C. 19: 844); washing is carried out in a six-stage, single-drum washer. An illustrated description of the installations is given, and operating data are presented. Among the advantages claimed for the new system are reduction in steam consumption, manpower, and floor space, better and more efficient automatic control, and higher output per digester; power consumption is

somewhat higher than for batch operation. However, the power-consumption curve is more uniform, and for bigger mills, the difference is almost negligible. The strength properties of the resulting kraft paper are satisfactory. 4 tables and 10 figures. E.S.

COST—ACCOUNTING

KNOTT, RALPH B. Accounting for supplementary costs of labor. Paper Trade J. 133, no. 3: 22, 24, 26, 28 (July 20, 1951).

The full cost of an hour's work to an employer includes not only the straight time rate for time worked, but many other costs that have been advancing rapidly in the past 15 years. Such other costs include: overtime, holiday and shift premiums, vacation costs, pension and insurance costs, welfare-fund payments, government old-age and unemployment benefit taxes, workmen's compensation payments, accident and hospital expense, reporting time and other allowances, and in certain operations, portal-to-portal payments. These fringe items have exactly the same effect upon production costs and selling prices as though they were straight time wages. The author discusses some of the accounting methods employed by Fiberboard Products, Inc. for covering these fringe costs. The importance of an accurate knowledge of this individual overhead item is stressed, as well as the need for educating employees with regard to its magnitude. E.S.

DESICCANTS

MILLER, ROBERT N., and ROBERTSON, WILLIAM E. Double shelf life? It's "in the bag." Food Eng. 23, no. 7: 38-9, 147 (July, 1951).

Ten days' to two weeks' longer freshness and crispness of potato chips during the summer months can be obtained in hot, humid climates like Florida by inserting special small packets of activated carbon and silica gel in perforated cellophane envelopes in the sealed cellophane bags. The carbon absorbs any objectionable odor which forms and is as effective in maintaining freshness and flavor as were any of the 42 antioxidants tested. Experiments also revealed that a mixture of activated carbon and silica gel will effectively maintain good flavor, odor, and crispness of potato chips packaged in unsealed waxed paper bags for periods of a week or more under the severe test conditions employed, which would be equivalent to at least two weeks of normal hot-weather storage. 2 tables and 2 illustrations. M.W.

DIGESTERS

ANON. Digester installation at Columbia Cellulose. Pulp Paper Mag. Can. 52, no. 7: 136-7 (June, 1951).

The five welded sulfite digesters installed by the Dominion Bridge Co. Ltd. in the new sulfite mill at Prince Rupert, B.C. are 19 feet in diameter and 59 feet in over-all height, and designed for a working pressure of 135 p.s.i. at the top. They were shipped in sections from Montreal and Vancouver to Prince Rupert, and welded, radiographed, and stress-relieved in their final location; only the top and bottom cones were completely fabricated at the shop. Details of the operations involved in the erection of the digesters are given. 3 figures. E.S.

DISINFECTION AND DISINFECTANTS

PEHRSON, STIG O. Experiences gained during the year 1950 in the application of organic mercury compounds against fungal attack of wet groundwood pulp. Svensk Papperstidn. 54, no. 12:

401-7 (June 30, 1951). [In Swedish; English summary] *cf.* B.I.P.C. 21: 544-5.

Phenylmercuric compounds have been employed extensively in Sweden for several years for protecting wet groundwood pulp against fungal attack. Several effective preparations, which are especially adapted for the application to groundwood pulp, are available on the Swedish market. These disinfectants may be added, undiluted or diluted with water, at the most suitable point in the system, because the phenylmercuric ion shows a great affinity for the fiber. A 10% solution of Pulpasan (phenylmercuric acetate), which is the preparation most commonly employed in Sweden, is usually added at a rate of 250 g./ton of wet pulp (50% moisture content). The cost of this treatment usually does not exceed 1.25 Swedish crowns per ton of wet pulp. The treatment does not result in a sterile product, but gives a satisfactory protection from a commercial viewpoint. The mercury content of the treated pulp seems to decrease on prolonged storage, so that the chances of fungal attack increase. Wet pulp treated with phenylmercuric compounds has been stored for 17 months (15 months in England) without being attacked by either bluing or rot fungi. However, in one case, fungal attack could not be prevented any longer than six to eight months, probably because of a rapid drop of the mercury content of the bales. In a third case, the treated pulp was still in perfect condition after eight months' storage. 4 tables, 4 figures, and 11 references. E.S.

DRYING—PAPER

BRECHT, W., and KÖRNER, L. Comparison of infrared and contact drying of paper in laboratory experiments. Das Papier 5, no. 10: 182-90 (May, 1951). [In German]

The cost of high-frequency and infrared drying processes preclude their exclusive application to drying problems in the paper industry; however, when combined with conventional drying procedures, particularly in conversion processes, they may offer distinct advantages. The authors studied various factors affecting the efficiency of a small infrared laboratory radiator (I) with black radiating surface and compared the data with those obtained with a steam-heated drying drum. The laboratory installations and methods employed are described in detail. The experiments consisted in the determination of the temperatures imparted to the paper surface and the factors which exert an influence, the study of the course and duration of the drying procedure proper, and a comparison of the data and curves with those obtained by contact drying upon the drum drier. The temperature which (I) imparts to moist papers decreases with increasing distance between the two; it reaches a permanent value after a certain period of exposure which is independent of the distance. The heating proceeds much faster with relatively dry, light paper held close to (I) than with very wet papers of high basis weight held at greater distances from the heat source. The same holds for the cooling of heated papers, which proceeds rapidly at low moisture contents and light basis weights. However, whereas the heating from 25 to 60°C. of a paper of 100 g./sq. m. basis weight and 77% moisture content at a distance of 10 cm. from (I) required only 60 seconds, cooling within the same range required 200 seconds, a fact which assumes importance in the planning and construction of large-scale installations. The same dependence upon distance from heat source holds for the drying of papers. The absolute moisture content is the factor which exerts the greatest influence upon the drying period, so that with high initial moisture contents and basis weights, drying requires the longest time. Slowness and density of the paper sheet also retard the process somewhat, whereas it decreases slightly with filler content and is apparently not influenced by sizing. In general, the drying curves of infrared

and contact drying proceed in a similar manner although, under otherwise identical conditions, infrared requires six times as long as contact drying. However, emphasis is placed upon the fact that the efficiencies of (I) and the much larger drying drum are not directly comparable. 22 figures and 5 references. E.S.

DYES AND DYEING

ANON. It started with solium. Chem. Week 69, no. 2: 31, 33 (July 14, 1951).

Optical bleaches, although utilized principally in the soap industry, are also applied at an increasing rate in the textile and paper fields, where they are used for whitening high-quality products. 1 illustration. M.W.

ECONOMICS, INDUSTRIAL

MODERN INDUSTRY. New facts on U. S. industrial economy. Modern Ind. 22, no. 1: 55-8 (July, 1951).

On the basis of the two relationships: (*a*) that the output of every industry forms the input for other industries, and (*b*) that a change in the output or input in one industry must reflect in the input and output of all other industries, Wassily Leontief of Harvard University has studied the U. S. economy and published the results in his book "The structure of the American economy, 1919-39," New York, Oxford University Press, 1951. The results of this study are summarized in an output-input chart, which is adapted from the book. Across the top and along the left column of the chart are listed each major industry, including households, which represent the consumer and worker. The vertical column indicates the source of the industries' input; for example, in 1939 pulp and paper received 85 (all figures represent millions of dollars) from agriculture, 679 from pulp and paper, 31 from industrial equipment, 48 from coal and coke, 494 from households, etc., for a total of 2607. The horizontal row indicates the distribution of the industries' output; for example, the pulp and paper industry sold 244 to food processing, 679 to pulp and paper, 432 to printing and publishing, 300 to trade, 184 to households, etc., for a total output of 2636. From a study of these figures and the changing pattern, the relationship of one industry to another may be seen, the pattern of expansion may be determined, and the adjustments noted which take place normally and under the artificial stimulus of war; it may even be possible to predict the effects of reshuffling of resources. 2 charts. H.B.

ELECTRONICS

THOMAS, H. A. Research applications of electronics. Chemistry & Industry no. 27: 588-95 (July 7, 1951).

A review is presented of some of the electronic devices which can be applied to instrumentation or utilized in the development of research methods. Various types of instruments used for the measurement of electrical changes produced by mechanical displacement, light-intensity variations, and variations in physical properties are described. Some of the physical and chemical effects of ultrasonic waves and the applications of the electron microscope are also mentioned. 22 figures. M.W.

TRUMP, J. G., and PROCTOR, B. E. Sterilizing with electrons. Modern Packaging 24, no. 11: 105-6, 164 (July, 1951).

A new cathode-ray technique permits low-temperature sterilization of foods and drugs on a conveyor line after packaging. High-energy electrons from

a Van de Graaff electrostatic generator effectively destroy micro-organisms virtually without heat, and with no adverse effects, in such diverse products as penicillin, surgical sutures, dressings, anticoagulants, and wheat. The effectiveness of the electrons is limited only by the thickness of the product, and since range increases with voltage, the required dose can be determined and controlled with precision. The method may be applied to containers of metal, glass, a combination of metal and fiber, or plastic materials, provided they are capable of being hermetically sealed and rendered impermeable to micro-organisms. 2 figures and 2 references. M.W.

ESPARTO

PARTRIDGE, H. E. Some notions in connection with grass boiling. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 183-201; discussion: 202-8 (February, 1951).

The author emphasizes that parallel operations apply to different industries, i.e., that simple fundamentals may be applied with widely varying means for similar requirements, whereas on the other hand, a similar means for varying requirements can be equally well applied. He discusses the shortcomings of digesting and drying esparto grass, particularly the nonuniform practices used in different mills to achieve essentially the same goal, which does not indicate that the most efficient operations are employed. With reference to the urgency of fuel economy, thought-provoking suggestions, partly borrowed from other industries, for improving the efficiency on a thermal basis are given. Special stress is placed on the need for reconsideration of long-accepted practices which on that account are regarded as the best ways of achieving desired results. E.S.

FIBER—ANALYSIS

CLARK, JAMES D'A. Notes on weight factors for fiber microscopy. Tappi 34, no. 7: 317-18 (July, 1951).

The weight factor of a fiber is proportional to its average weight per unit length, which may be determined by simple projection means (*cf.* B.I.P.C. 13: 142). The factor is then calculated in comparison with standard rag fiber which may be defined as having a weight factor of 1.00 with a grex (grams per 10,000 meters) of 1.80. As a new empirical rule for determining the percentage of unfamiliar fibers in a sample, their weight factors tentatively may be taken to be their average width in microns, divided by 20 for rag, 30 for coniferous, and 35 for deciduous or grass fibers. 1 table and 5 references. E.S.

FIBER—DIMENSIONS

FYFE, THOMAS. An optical projection method for measuring fiber length. Tappi 34, no. 7: 306-10 (July, 1951).

Several articles have been published on the value of fiber-length measurements and on various methods for measuring fiber length, but there is still much need for a method, specifically designed, for the routine measuring of fiber length on a laboratory scale. An optical projection method is described which is used daily for the routine measurement of fiber length in pulp and unsized paper. The method and apparatus are described in sufficient detail to permit easy adoption by anyone in need of a method. Most of the steps in the method are used or well known by present-day fiber analysts. Statistical data are included to show the reproducibility of the method, and various types of graphs are also included to illustrate a number of ways in which results may be reported. 3 tables, 10 figures, and 5 references. E.S.

FISH PROTECTION

ANON. Columbia Cellulose fish ladder. Pulp Paper Mag. Can. 52, no. 7: 165 (June, 1951).

A brief reference is made to the ingenious fish-ladder system installed by the company on the Cloyah River near Prince Rupert for the avoidance of any interference with existing natural runs of various species of salmon; the installations were developed in co-operation with the Department of Fisheries. E.S.

FLAX

LAFONTAINE, G. H. Linseed flax straw—its use in paper making. Pulp Paper Mag. Can. 52, no. 7: 142-5 (June, 1951).

The author discusses principally the difficulties of flax straw procurement and the reasons for the variations in yield per acre from year to year. As it is extremely difficult to estimate the tonnage of straw which can be secured from a given number of districts, the straw buyer must protect himself against possible crop failures in districts relatively close to the plant by extending his purchasing activities to districts beyond the most economical limits. The baling of flax straw, inspection in the field, shipping, stacking of bales, and processing in decorticating machines to prepare paper tow (bast fibers) also receive consideration. For the conversion of the paper tow to pulp, reference is made to the description presented by Spencer (*cf.* B.I.P.C. 17: 170). 1 table. E.S.

FORESTS AND FORESTRY

LEVÓN, MARTTI. The forestry of Argentina. Paper and Timber (Finland) 33, no. 4a: 94-8; no. 5: 182-4; no. 6: 210-13 (Special issue, April-June, 1951). [In Finnish; English summary]

The author gives an illustrated description of his impressions of the forests and forestry in Argentina which he gathered during a recent trip. 2 tables and 16 illustrations. E.S.

MOIR, STUART. The pulpwood situation in the Pacific Northwest. Paper Mill News 74, no. 28: 124, 126, 128, 130, 158 (July 14, 1951).

The pulpwood situation in the Pacific Northwest with ever-increasing demands for wood supplies is a challenge to management and foresters alike. Everyone engaged in papermaking has a stake in this situation. Timber is the great crop of the Northwest, and there will be an ample supply of pulpwood to meet the growing industry if more volume of timber will be harvested from each acre, if sound forest practices are applied in lumbering operations and improved forest management principles in handling the forests, and if losses from insects and fire are drastically reduced. E.S.

MURDOCK, HAROLD R. The changing Japanese pulpwood situation. Paper Mill News 74, no. 29: 17 (July 21, 1951); Newsprint Service Bur. Bull. no. 403: 7 (August, 1951).

Reference to the critical condition of the Japanese forests is made, and the need for drastic action to prevent exhaustion of the available wood supplies within the near future is emphasized. E.S.

NEKOOSA-EDWARDS PAPER COMPANY. Pioneers new tree planter. Pulp & Paper 25, no. 8: 79 (July, 1951).

Reference is made to the construction and operation of a new, double-row tree planter which is now operating on the company's central Wisconsin

timber holdings. On the first eight-hour trial run of the machine, 24,000 trees were set out; it is expected that this rate can be increased when the crew (one tractor driver and four men) become better familiarized with its operation. 1 illustration. E.S.

PULP AND PAPER MAGAZINE OF CANADA. The Canadian forests as seen by six Canadian artists. Pulp Paper Mag. Can. 52, no. 7: 127-34 (June, 1951).

Six colored reproductions of forest landscapes (western hemlock, spruce, jack pine, hemlock, balsam, and poplar) by Canadian artists are presented. E.S.

TURCOTTE, LAWSON P. The pulp situation. Paper Mill News 74, no. 28: 97-8 (July 14, 1951); Paper Trade J. 133, no. 2: 64, 66, 68 (July 13, 1951).

The author discusses the possible fiber supply for the longer range based upon past experiences and future trends in fiber uses. The growth of the pulp industry on the West Coast and in the South are reviewed and further constructive steps outlined, including constant research by public and private bodies, the return to private ownership of State and Federal logged-off lands, continued efforts to combat fires and insects, a realistic tax program, and greater recognition of the importance of forestry personnel. E.S.

FUEL

NORTHEASTERN WOOD UTILIZATION COUNCIL. Wood fuel. Northeastern Wood Utilization Council, Bull. no. 35: 7-77 (June, 1951).

The utilization of low-grade wood, chipped wood, or wood waste as fuel was the subject of a conference held jointly by the Council and the Forest Products Research Society. The papers presented at the meeting, the resulting discussion, and additional material comprise this handbook on the use of wood for fuel. The papers included in the bulletin are listed by author and title: Baldwin, Henry I. The world wood fuel situation, p. 7; Heermance, Edgar L. Wood fuel in a national emergency, p. 9-13; Miller, R. H. P. Characteristics of wood as fuel, p. 15-20; Simmons, Fred C. Harvesting fuelwood in stick form, p. 21-33; discussion, p. 33-4; Alexander, R. R. Source and availability of chipped wood for fuel, p. 35-8; Allen, John W. Use of chips in gravity feed stoves, p. 39-49; discussion, p. 49-51; Miller, Earle C., and Hansen, George E. Spreader stoker firing of wood and coal in multiple fuel furnaces—6 references, p. 53-71; discussion, p. 71-2; Letts, Walter W. Briquets from sawdust, bark and other waste, p. 73-6; discussion, p. 76-7. Tabulated data and illustrations are included. M.W.

GROUNDWOOD PULP

PIIPPONEN, HEIKKI. Mill storage of pulpwood for groundwood mills. Paper and Timber (Finland) 33, no. 4a: 149-52 (Special issue, April, 1951). [In Finnish; English summary]

The storage of pulpwood in groundwood mills calls for more than the receiving and piling of the bolts; the material must be properly handled to obtain the best possible grinding results. A moisture content of 40% is generally considered to be the most satisfactory. The wood arriving at the mill yard by rail or trucks with a moisture content of 20-25% is not suitable for grinding; neither does floated wood with approximately 30% moisture meet

the above requirement. In addition, the moisture content of floated timber is usually not uniform; the submerged sections may be satisfactory, whereas the sections above water may in many respects be similar to wood shipped by rail. To solve the moisture problem at the Inkeroinen mills of Tampella, Finland, all incoming pulpwood, whether floated or shipped by rail and truck, is bundled and stored in water. After a sufficient soaking period, the bundles are turned upside down. The turning must be carefully timed and the above-water portion of the turned bundle must not be allowed to dry out before grinding. The spraying of the bundles might also be taken into consideration. The grinding of green timber might offer a partial solution to this problem; however, transportation costs limit the use of green wood. 1 map. E.S.

WICHMANN, ARNE. Pulpwood for groundwood mills. Paper and Timber (Finland) 33, no. 6: 222, 224-5 (June, 1951). [In Finnish; English summary]

The quality of groundwood pulp depends principally upon the wood used in grinding. The moisture content of the wood should be at least 40% or more for obtaining the best and strongest pulp. The quality of the pulp is noticeably lowered when the moisture content of the wood is reduced to 30% and becomes poor when it falls below this value. The bound water should never be allowed to escape from the wood to prevent deformation of the fiber cells. If this should happen, the original form of the fibers can never be restored by later soaking of the wood. Finnish groundwood mills grind largely logs 1 m. in length, and hence the procurement should be standardized to this size and its multiples (1 to 6 m.), according to local conditions. The log length should be determined with regard to many variables, such as cost of procurement and maintenance of the highest possible moisture content at the time of grinding. E.S.

GUMS AND RESINS

OLSSON, GUNNAR, and BRANDBERG, ÅKE. The identification of resin acids from wood tar. Svensk Kem. Tid. 63, no. 3: 73-90 (March, 1951). [In Swedish; English summary]

The amine salt technique of Harris (*cf.* B.I.P.C. 19: 316-17) has been applied to the isolation and identification of the resin acids from wood tar obtained from a stump of *Pinus sylvestris*. The resin acids which could be precipitated with cyclohexylamine (about 22% of the tar or about 80% of the difficultly esterified acids in the tar) were found to contain 70-75% dehydroabietic, 10-12% abietic, and 4% dihydroabietic acid; some results suggest the presence of about 3% neoabietic and less than 10% dextropimaric acid. Levopimaric and isodextropimaric acids were not detected. The analytical methods are described in detail. 4 tables, 5 figures, and 51 references. E.S.

HISTORY

GRIFFITH, F. T. Founders of paper industry in Oregon. Paper Mill News 74, no. 30: 11-15 (July 28, 1951).

To commemorate the founding of the first paper mill in the state of Oregon, a historical marker was erected by the Pacific Coast Division of the American Pulp and Paper Mill Superintendents Association on June 26, 1951 on the site of Lot 5, Block 2 of Oregon City, where W. W. Buck had constructed the Oregon City Paper Mills in 1867. The mill was equipped with a cylinder machine and initially made brown wrapping paper from straw; this first effort proved a failure, and the assets of the company were sold in September, 1867. A summary of the beginnings and growth of the industry

in Oregon is given, including the names of the individuals responsible therefor (see also Paper Mill News 74, no. 28: 90 [July 14, 1951]). 1 illustration. E.S.

INSECTS AND VERMIN

BLOCK, S. S. Protection of paper and textile products from insect damage. Ind. Eng. Chem. 43, no. 7: 1558-63 (July, 1951).

This work deals specifically with the prevention of the destructive activities of American cockroaches as applied to sized and glued textile and paper products and in the penetration of paper packages. It was found that starch sizing was much more difficult to protect than gelatin or gum, but inert, water-insoluble coatings of sufficient thickness prevented attack of sized surfaces. Of 68 chemicals, only mercuric chloride and the alkali thiocyanates gave complete protection. Food-containing paper packages were completely protected by treatment with saturated solutions of ammonium thiocyanate, ammonium nitrate, or magnesium chloride. The factors which are suggested for determining taste repellency are water solubility, hygroscopicity, ionic mobility, and specific chemical activity. In practical application, taste repellents may be recommended where the use of insecticides is impractical or undesirable. 9 tables, 5 figures, and 14 references. M.W.

LAWS AND LEGISLATION

PARKER, LEO T. Effect of workmen's compensation laws. Fibre Containers 36, no. 7: 76-9 (July, 1951).

A number of legal cases and court decisions are discussed to show the liability of employers for damages resulting from the negligence of their employees; special reference is made to the vast legal difference between a legal employer and an independent contractor. E.S.

LIGNIN

FREUDENBERG, KARL, and GEHRKE, GÜNTER. *p*-Coumaryl alcohol and its dehydrogenation polymer. Chem. Ber. 84, no. 5-6: 443-51 (June 21, 1951). [In German]

Because *p*-hydroxybenzoic acid has been obtained as a degradation product of lignin, it is possible that *p*-coumaryl alcohol (I) or one of its derivatives may be a constituent of the lignin molecule. (I) was therefore synthesized and subjected to an enzymatic dehydrogenation. On reduction of *p*-acetylbenzoyl chloride with hydrogen and palladium as catalyst, *p*-hydroxybenzaldehyde (II) was formed which was condensed with malonic acid monoanilide to give *p*-coumaric acid anilide (III). (III) was rearranged with phosphorus pentachloride to the phenylimide chloride which, on reductive scission, gave *p*-hydroxycoumarylaldehyde (IV). Condensation of (IV) with monomethyl malonate gave methyl *p*-hydroxycoumarate which, on reduction with lithium aluminum hydride, gave (I). Similar to coniferyl alcohol, (I) is readily polymerized by acids to an acid polymer. With mushroom dehydrogenase (I) gives a polymer which behaves very similarly to native spruce lignin. 1 table, 2 figures, and 31 references. F.E.B.

FREUDENBERG, KARL, KRAFT, RICHARD, and HEIMBERGER, WERNER. Sinapinyl alcohol, coniferyl alcohol, and their dehydrogenation polymers. Chem. Ber. 84, no. 5-6: 472-6 (June 21, 1951). [In German]

The condensation of syringaldehyde with monoethyl malonate gives ethyl sinapinate which, on acetylation, gives ethyl acetylsinapinate (I). Reduction

of (I) with lithium aluminum hydride gives sinapinyl alcohol (II). (II) is also obtained on enzymatic cleavage of syringin, isolated from the bark of lilacs. Dehydrogenation of (II) with a crude emulsin gives dehydrodisinapinyl alcohol which may be structurally related to the lignans. When (II) is treated with air in the presence of mushroom press juice, a nitrogen-containing polymer is obtained which gives the lignin reactions only faintly. Coniferyl alcohol and crude emulsin give an amorphous polymer which shows the color reactions and solubility properties of isolated native spruce lignin. Indications have been obtained that coniferin and similar glucosides within the cambium layer are hydrolyzed by a glucosidase at the place of lignification and that the aglucon undergoes a dehydrogenation-polymerization. 9 references. F.E.B.

GOTTLIEB, SIDNEY, and PELCZAR, MICHAEL J., JR. Microbiological aspects of lignin degradation. Bact. Revs. 15, no. 2: 55-76 (June, 1951).

Following a brief discussion of lignin chemistry and the limitations, from a chemical and analytical point of view, of the study of lignin, a review of the work reported to date on the microbiological degradation of lignin is presented. Many investigations are cited to prove that the higher fungi slowly degrade lignin in nature; however, nothing is known about the intermediary metabolism of this degradation. No specific or identified bacterial species has been reliably associated with the natural degradation of lignin, and no enzyme preparation has been reported which catalyzes the cleavage of a carbon-carbon or carbon-oxygen bond in either isolated or *in situ* lignin to bring about a significant decrease in its molecular size. The availability of a method for isolating lignin in an unchanged state and improvements in microbiological and enzymatic techniques should lead to an elucidation of the microbiological degradation process. 97 references. M.W.

LIGNIN—HYDROGENATION

PEPPER, J. M., BROUNSTEIN, C. J., and SHEARER, D. A. Studies on lignin by means of catalytic hydrogenation of aspen wood and wheat straw. J. Am. Chem. Soc. 73, no. 7: 3316-19 (July, 1951).

Thatcher wheat straw and aspenwood meals have been hydrogenated under conditions which effected complete solubilization of the lignin. The natures of the isolated lignin fractions of these two angiosperms were compared by techniques of separation based on varying degrees of acidity and chromatographic adsorption. Ultraviolet absorption spectra of the several lignin fractions indicated only minor differences; all curves were typical of other isolated lignins and basically aromatic. From straw, but not from wood, methanol is produced by hydrogenation in larger amounts than may be accounted for by the loss of methoxyl groups. From the aspenwood three lignin degradation products were isolated, 4-hydroxy-3-methoxyphenylethane, 4-hydroxy-3,5-dimethoxyphenylethane, and 2-(4-hydroxy-3,5-dimethoxyphenyl)-ethanol in yields of 2.0, 2.6, and 0.37% (based on the Klason lignin content of the wood), respectively. It is suggested that the isolation of phenylethane derivatives indicates a β-γ linkage in the protolignin which is susceptible to cleavage under alkaline conditions but not so under neutral or mildly acidic conditions from which phenylpropane derivatives have been obtained previously by a similar hydrogenation. 2 tables, 3 figures, and 13 footnotes. E.S.

LIME AND LIMESTONE

TOCK, W. T. Operation and maintenance of lime sludge kilns. Paper Mill News 74, no. 28: 112, 114, 116, 118 (July 14, 1951);

Paper Trade J. 133, no. 2: 93-6 (July 13, 1951); Southern Pulp Paper Manuf. 14, no. 7: 20, 22, 24 (July, 1951); Paper Ind. 33, no. 5: 551-2, 554 (August, 1951).

It is of prime importance to give consideration to the operation and maintenance of lime-sludge recovery kilns to avoid costly chemical waste and disruption of a balanced operation. Uniform production of lime from a kiln, uniform operating conditions, and optimum fuel consumption can be obtained only if the kiln is fed at a constant and uniform rate with a feed of constant analysis and constant moisture content. Some of the methods for obtaining this constant rate involve the use of a controlled pump, weir and weir-box, cake-thickness gage, and a ferris-wheel feeder. Fluctuations in the consistency of the mud to the filter lead to irregularities in the volume of sludge feed to the kiln. Samples should be obtained from sampling holes to evaluate the reduction in moisture content and to obtain a picture as to what pellet formation is taking place; the lime should be discharged from the kiln in the form of dust-free pellets. Corrective measures for back-spilling and ring formation are outlined. The kiln operator should have a record of the feed-end gas temperature, the burning-zone temperature, the rate of fuel flow, and the draft at the feed end of the kiln and at the firing hood. A kiln must be adjusted periodically and checked at regular intervals to keep it in perfect alignment. When a kiln with a hot charge is suddenly stopped, such as through a power failure, a warped kiln or distorted kiln shell may result. It is very difficult to restore a warped shell to its original condition; the use of a gasoline engine as an auxiliary drive to rotate the kiln at a slow rate of speed during a power failure is a good insurance against troubles resulting in warping. The auxiliary drive can be provided at a small additional cost on the initial installation. E.S.

MACHINERY

MELVIN, T. S. F. Some overseas developments in machines used in the paper industry. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 209-25; discussion: 226-8 (February, 1951).

Brief descriptions are given of the Jönssen vibratory screen, the Jönssen-Lindgren rotary screen, the Säll consistency regulator (all Swedish developments), and the Stapley Pulpmaster, which was developed in Canada and afterwards perfected in the United States. 1 table and 10 figures. E.S.

MACHINERY—CORRUGATING MACHINE

BOXBOARD CONTAINERS. Basic combining principles of corrugating machines. Boxboard Containers 69, no. 703: 46, 49 (July, 1951).

In a series of drawings the basic relationships between various corrugator parts of five corrugating machines currently in use are shown. The corrugators represented are manufactured by the Samuel M. Langston Co., the M. D. Knowlton Co., the F. X. Hooper Co., Inc., George W. Swift, Jr., Inc., and the S&S Corrugated Paper Machinery Co., Inc. 5 illustrations. M.W.

CASSIDY, R. T. Present operating problems and future hopes of a corrugated superintendent. Tappi 34, no. 7: 24A; discussion: 24A, 26A (July, 1951).

The importance of good housekeeping and preventive maintenance as requisites for good operation are stressed. Better-designed corrugators to operate at higher speeds (up to 1000 ft./min.) with automatic splicing equipment and side guides are the aims of new developments. E.S.

GOETTSCH, WALTER. Past, present, and future design of corrugated combiners. Tappi 34, no. 7: 26A, 28A, 30A, 32A, 34A; discussion: 34A (July, 1951).

Following a brief description of the single facer since its early beginnings in 1870, a typical modern unit is discussed which will operate at speeds up to 500 ft./min., including double facers or combiners. Reference is also made to possible future improvements in the construction. E.S.

MONTGOMERY, A. E. Theoretical problems of heating and drying. Tappi 34, no. 7: 34A, 36A (July, 1951); Fibre Containers 36, no. 7: 44 (July, 1951).

Corrugator operation is treated as a heat-transfer problem, and the factors which affect the over-all heat conduction are enumerated. E.S.

MACHINERY—CUTTERS

The CLARK-AIKEN COMPANY, *Lee, Mass.* New heavy-duty sheeter. Fibre Containers 36, no. 7: 104-5 (July, 1951); Am. Paper Converter 51, no. 8: 16, 18 (August, 1951).

A brief description of the new type H, high-speed, heavy-duty, co-ordinated cutter-delivery-layboy unit, the largest in the line, is given; it is intended for the high-speed cutting of board and pulp, and multiple sheeting of paper, drawing from as many as 32 rolls of eight-pound bond paper at a time at speeds of zero to 800 ft./min. 1 illustration. E.S.

MACHINERY—ELECTRIC EQUIPMENT

KROPF, VICTOR J. Motors & motor control. Chem. Eng. 58, no. 7: 123-36 (July, 1951).

A discussion of motors for constant-speed and variable-speed drives, and factors in the selection, relative cost, control equipment, and mechanical features of motors is presented. Among the typical applications paper-mill machinery is listed. 5 tables and 30 figures. M.W.

MACHINERY—FELTS

SHEMA, B. F. Why don't your wet felts last longer? Paper Ind. 33, no. 4: 400-3 (July, 1951).

The author discusses the three types of deterioration of felts in a paper mill: chemical, mechanical, and bacterial degradation, methods for identifying the causes, and possibilities for the control of microbiological degradation. 10 photomicrographs and 3 figures. E.S.

MACHINERY—PACKAGING MACHINERY

STADLER, HURTER & COMPANY, *Montreal.* The S-H automatic paper roll wrapping machine. Pulp Paper Mag. Can. 52, no. 7: 146-7 (June, 1951); *cf.* B.I.P.C. 21: 323.

The continuous operation of the machine is described. 1 diagram. E.S.

MACHINERY—PRESSES

CUTRO, JOSEPH. Overhead primaries on Black-Clawson board machines. Pulp Paper Mag. Can. 52, no. 7: 138-9 (June, 1951).

The advantages of primary press rolls installed over the vats are discussed; valuable floor space is conserved and much shorter top felts are required. On machines which are scheduled for rebuilding for greater pro-

duction, the relocation of overhead primaries provides space for needed additional equipment. 2 illustrations. E.S.

TIMGREN, LARS. Controlling the work of the wet presses. Paper and Timber (Finland) 33, no. 4a: 122-5 (Special issue, April, 1951). [In Finnish; English summary]

The uniform drying of the web depends to a great extent on the crowning of the rolls in the wet presses. By the use of a colored ribbon placed on a paper to take prints of the nip and the passage of the combination between two rolls, it is possible to detect irregularities and coarse defects present in the crown of the rolls. In addition, the actual linear pressure (kg./cm.) and the actual surface pressure (kg./sq. cm.) between the rolls can be determined from the prints. With the aid of the prints and measurements of the rolls, new, corrected crown curves can be constructed, by means of which a predetermined linear pressure, uniform or variable, can be obtained. The total deflection of the rolls can also be determined. This same principle for control and measurement can also be applied to other press rolls. 8 figures. E.S.

MACHINERY—PRINTING MACHINE

ANON. Advanced press principles speed cutting-creasing output. Boxboard Containers 69, no. 703: 6-8 (July, 1951).

The Bobst Autoplaten press, an automatic-platen cutting and creasing press which turns out 4500 sheets per hour, is described. Its design is intended to reduce downtime to a minimum and secure an output close to its running speed. It is of the "toggle motion" type. The upper platen is fixed and holds the chase with the cutting form. The lower platen is movable, with a stroke of two inches, and supports the steel cutting plate. It employs regular steel dies and takes a maximum sheet size of 30¾ × 42½ in. Makeready time is reduced by a micrometer device which elevates the platen of the press and a chase and steel plate which can be removed and reinserted into the machine without adjustment. The press is manufactured by Bobst & Fils, Switzerland, and sold in this country by Thomson-National Press Co., Inc., Franklin, Mass. 5 illustrations. M.W.

H. H. HEINRICH, INC., *New York*. Speeds up to 1,000 f.p.m. claimed for new H. H. Heinrich "jet" aniline press. Am. Paper Converter 25, no. 7: 20 (July, 1951).

A brief description of the new H.H.H. "jet" aniline printing press is given which will handle all types of stock, including paper, cellophane, Pliofilm, polyethylene, and foil. Although the press can handle webs at a maximum speed of 1000 ft./min., there are as yet no suitable inks available which will dry sufficiently fast to print at that speed. 1 illustration. E.S.

MILLER-LAUFFER PRINTING EQUIPMENT CORPORATION, *New York*. Makes first shipments on new envelope press, said to print 100,000 per hour. Am. Paper Converter 25, no. 7: 18, 20 (July, 1951); *cf.* B.I.P.C. 21: 23.

The operation of the "M-L" envelope printing press is outlined; the press is of the rotary type and uses duplicate rubber plates, so that for each revolution of the cylinder, two envelopes are printed. It is reported that approximately 36,000 envelopes per hour is the highest speed at which one operator can feed and repack; with a second operator, production can be maintained at 72,000 per hour. The press is claimed to print made-up envelopes at speeds up to 100,000 envelopes per hour; the quality of the printing meets normal commercial envelope-printing standards. 1 diagram. E.S.

MACHINERY—REFINERS

EBERHARDT, LEE E. Stock preparation in board mills. Paper Mill News 74, no. 28: 106, 108-9, 111 (July 14, 1951); Paper Trade J. 133, no. 2: 84, 86, 88, 90, 92 (July 13, 1951); Can. Pulp Paper Ind. 4, no. 8: 10-12, 14 (August, 1951); *cf.* B.I.P.C. 21: 707.

Modern revolving disk mills are new in stock-preparation applications; however, they are finding increasing acceptance. Their unique refining characteristics will produce completely defibered stocks with strength characteristics claimed to be unobtainable with the traditional beater and jordan. They provide an excellent means for the preparation of board-mill stocks, including waste papers, deinked papers, and wet-strength papers. The two types of disk mills, the single and double disk mills, are illustrated and discussed with reference to design, refining abilities, and mill applications. Plant layouts of a typical stock-preparation system and a deinking system are presented, with comments and results obtained in mill and laboratory studies. Because of the great flexibility of treatment provided by the many controllable factors, such as speed, plate design, consistency, etc., these mills promise to play a very important part in stock-preparation installations of the future. 1 table, 2 flowsheets, and 3 illustrations. E.S.

PETRIE, GORDON. Preliminary refining of hot stock kraft. Paper Mill News 74, no. 31: 12, 16 (Aug. 4, 1951); Paper Trade J. 133, no. 2: 92-3 (July 13, 1951).

A complete installation of the Shartle pressure-type, hot-stock refining system is described, which is completely enclosed so that foam troubles are eliminated. It includes six No. 6 Hydramills with special conical-plug and shell-filling design and one standard No. 6 Hydrafiner which reduces the larger particles from the blowtank to such a size that they will readily enter the smaller working area of the Hydramill. Each Hydramill, as well as the one Hydrafiner, is equipped with Duotrol plug adjustment which assures uniform stock treatment. From a single, centrally located control panel the operator can make plug adjustments of all machines to suit the requirements of any cook. The equipment gives higher pulp yield and results in reduced cooking time and chemical cost; the fibers are uniformly prepared for the wash stages. 1 diagram. E.S.

MACHINERY—SAVE-ALLS

BROWN, J. Efficient handling of backwater. III. The Adka saveall. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 164-70; discussion: 171-82 (February, 1951).

The construction, operation, efficiency, and upkeep of the Adka saveall are described. 1 diagram. E.S.

GILMOUR, W. A. Efficient handling of backwater. II. The Fullner saveall. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 157-63; discussion: 171-82 (February, 1951).

The construction and operation of the Fullner sedimentation saveall are outlined. 2 tables and 3 figures. E.S.

JUELL, F. Efficient handling of backwater. I. The Sveen-Pedersen system. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 149-56; discussion: 171-82 (February, 1951).

The construction and operation of the saveall are described. 1 flowsheet and 4 illustrations. E.S.

MACHINERY—SLITTERS AND WINDERS

CAMERON MACHINE COMPANY, *Brooklyn.* Acetate slitter-rewinder has hydraulic drives to control tension, core heating. Am. Paper Converter 25, no. 7: 17-18 (July, 1951).

The construction and operation of the Triplex slitter and rewinder specifically designed for converting acetate film are described. 2 figures. E.S.

MACHINERY—SORTING MACHINE

JOHN SHAW AND SONS (HONLEY) LTD. The most advanced paper sorting machine so far produced. Paper & Print 24, no. 2: 208-9 (Summer, 1951).

A new paper sorting machine (Holm-Dale) is described which incorporates new practical features. The paper is brought to the machine on the same stillages on which it is delivered from the sheet-cutting machine, and the height of the paper is automatically adjusted to the level of the suction feed. As the sheets are conveyed onto the blanket, they are momentarily and automatically halted for inspection by a suction action. The sheets are also automatically counted by an electronic device. 1 illustration. M.W.

MATERIALS HANDLING

BREYMAN, E. A. Unitizing for profit. Am. Paper Merchant 48, no. 7: 13, 26 (July, 1951).

The achievements of the Zellerbach Paper Co. in the material handling of unit loads is described. Through the use of light paperboard and a wide-tapered, chisel-pointed fork, unit loads of cartons are constructed which facilitate handling from the plant to the distributor or the customer. The cartons are spot glued to each other and to the carrying sheet, and the unit is lifted and transported on the wide-tapered forks. This method effects considerable labor economies and reductions in the unit cost of storage. It also suggests a further field for the use of paper. 9 figures. M.W.

THE GOODYEAR TIRE & RUBBER COMPANY OF CANADA, LIMITED. New unloading mats. Can. Pulp Paper Ind. 4, no. 7: 22 (July, 1951); Pulp Paper Mag. Can. 52, no. 8: 156 (July, 1951); *cf.* B.I.P.C. 20: 497-8.

Reference is made to the landing mats of rubber and airfoam originally designed for the unloading of big newsprint rolls; the airfoam cushions the unloading shock, and the rubber cover binds the mats together. The mats can be of service wherever heavy articles are subject to damage during handling operations. 2 figures. E.S.

HUDSON, WILBUR G. How to handle chips with the continuous flow conveyor. Paper Ind. 33, no. 4: 404-6 (July, 1951).

The advantages of the continuous-flow or en-masse conveyor-elevator for certain applications are discussed; examples of its use for chip handling for filling digesters or storage bins are described, including data on speed, capacities, and power requirements. 5 figures. E.S.

MATERIALS OF CONSTRUCTION

HILL, L. E. Metal allocation. Paper Mill News 74, no. 28: 133, 138, 140, 142 (July 14, 1951); Paper Trade J. 133, no. 2: 68, 70, 72-3 (July 13, 1951).

The industrial freedom of development is now restricted by shortages of metals affecting steel, tungsten, cobalt, copper, aluminum, nickel, and almost every other alloying element. The application of controls was necessary and took the form of a system of single-level defense order priorities. The limited application of the Controlled Materials Plan (CMP) is slated to begin in the third quarter of 1951. The essential civilian production will be included; however, the alert use of alternate substitute materials will be necessary. E.S.

WILCOX, J. M., and GOW, JAMES T. Stainless high alloy steels —current developments affecting the pulp and paper industry. Paper Mill News 74, no. 29: 12, 14-16 (July 21, 1951); Paper Trade J. 133, no. 2: 80, 82-4 (July 13, 1951); Pulp & Paper 25, no. 8: 50, 52, 54 (July, 1951).

The commonly used designations for the different grades of high-alloy steels are explained, with particular emphasis on the difference between the wrought and cast grades. Tabular data are listed for the most commonly used types. The sources of supply of the various elements and raw materials which go into high-alloy steels are given, and the present availability or scarcity is mentioned. Substitutions of more readily obtainable alloy steels for those grades which are now difficult to obtain are suggested for both acid and alkaline pulping processes, as well as mildly corrosive applications. Mention is made of the industrial production capacity of both wrought and cast grades of high-alloy steels as they exist today, and a prediction for the future is given. Specific pulp and paper applications are discussed, such as maintenance and repairs, sulfur conservation, expansion of production, and the stream-pollution program. 2 tables. E.S.

METERS AND RECORDERS

LIIRI, OSMO. Electrical moisture meters for wood. Paper and Timber (Finland) 33, no. 4a: 126-32 (Special issue, April, 1951). [In Finnish; English summary]

The accuracy of three electrical moisture meters was tested on Finnish pine, spruce, and birch samples of low, standard, and high specific gravity. The meters included the American Moisture Register, Model K2D (I), the German Gann-Hydromat (II), and the old Siemens and Halske meter (III); (I) and (II) are based on the measurement of the dielectric properties of wood, and (III) on the measurement of its electrical resistance. The results of the tests are given in a number of curves obtained with specimens of uniform moisture content. They show that the meters based on the measurement of the dielectric constant are not superior to those based on the measurement of resistance; the pronounced influence of the specific gravity of the wood samples proved the greatest drawback in their use. However, an experienced tester will easily evaluate the specific gravity with the accuracy needed for this purpose. If it can be established that the moisture content of wood samples with uneven distribution of moisture can be measured with meters of the capacity or radio-frequency, power-loss type, and if the range of measurement of these meters can be extended beyond the fiber-saturation point, it is quite likely that they will supersede the resistance-type moisture meters. 2 tables, 7 figures, and 11 references. E.S.

MILL CONTROL

NEWCOMB, DONALD. Quality control as an aid in the manufacture of glassine. Paper Trade J. 133, no. 1: 22, 24-5 (July 6, 1951).

The author discusses the control of raw materials (pulps, water, chemicals, etc.), process control, and product control, with particular reference to the routine tests performed by the control testing station in the manufacture of glassine paper. E.S.

MILL MANAGEMENT

BASBERG, A. From Kiaer & Co. to Union Bag. Norsk Skogind. 5, no. 5: 149-51 (May, 1951). [In Norwegian]

The author discusses the living standard of the American industrial worker and industrial relations in a pulp and paper mill, with particular reference to the Union Bag & Paper Corporation. E.S.

NEWSPRINT

SINGH, CHATTAR. Newsprint industry. Indian Pulp and Paper 5, no. 10: 414-16, 425 (April, 1951); Newsprint Service Bur. Bull. no. 403: 2-3, 5 (August, 1951).

Consideration is given to the establishment of a newsprint industry in India. The chief impediment at the present time is the lack of information on the amount and availability of suitable pulpwood and suitable manufacturing facilities. Paper mulberry is mentioned as a possible source of pulpwood, and its suitability has been established (*cf.* B.I.P.C. 21: 176), but the economic feasibility of its use is not yet known. The need for a government survey of the coniferous forests of India in order to evaluate their potentialities as a source of pulpwood for newsprint is emphasized. M.W.

NIPA PALM

CHITTENDEN, A. E., and COOMBER, H. E. Nipah palm petioles from Sarawak. Colonial Plant and Animal Prod. 1, no. 3: 222-30 +2 pl. (1950); Paper-Maker (London) 121: 11-12, 14, 16 (Mid-Summer, 1951).

Three samples of nipa-palm (*Nipa fruticans* Thumb.) petioles from northwest Borneo were cooked by either the soda or the sulfite process to evaluate the papermaking possibilities of the material. The sun-dried sample was the most promising, although it exhibited several undesirable features, whether cooked by the alkaline or acid process, such as high consumption of chemicals, low yield, dark color, and high drainage time of the pulp produced. The microscopic examination of the fractionated pulp showed that the wetness is principally caused by the presence of large quantities of nonfibrous tissues in the petioles. Even if it were possible to overcome the economic problems connected with the pulping of the raw material, the parenchymous matter would create serious problems in a paper mill, such as clogging of screens, contamination of white water, and the like. Unless some method can be devised to separate the nonfibrous material mechanically from the petioles prior to cooking, it is not considered that the chemical pulping of nipa palm would be either practical or economical. 5 tables (and 3 photomicrographs in the first reference). E.S.

PACKAGING

ANON. Damaged electrotypes. Am. Pressman 61, no. 8: 26-8 (July, 1951).

Electrotypes are often badly damaged in shipping, and in most cases damage occurs as a result of rough handling. Some packing techniques are described which will help to provide adequate protection for the plates. Emphasis is

placed on the extra protection to edges and corners provided by an extension of the wrapping board beyond the ends and sides of the plate. 5 illustrations. M.W.

ANON. Dry milk: problem child. Modern Packaging 24, no. 11: 71-5, 166 (July, 1951).

The special problems involved in the packaging of dry milk powders and the packaging methods which are used by some of the leading producers are described. Whole-milk powder must be protected against moisture and oxidation of the fat content, whereas with nonfat dry-milk solids, moisture is the principal difficulty. The customary container for whole-milk powder is a hermetically sealed metal can with a very low oxygen concentration as an additional safeguard. Sifting and reclosure are other problems involved in packaging nonfat dry-milk solids. A special type of folding carton with a protective inner liner, bag and box combinations with inner sealed bags of Pliofilm, cellophane, and Diafane, and composite metal and fiber cans are among the containers described which are currently used to market the product. 9 illustrations. M.W.

BRADFORD, ENID A. M. Date packing in Tunisia. Brit. Packer 13, no. 6: 24-6 (June, 1951).

The conditioning and packaging of Tunis dates is described. Because the dates are of high quality and require special handling, they are hand-packed in wooden-base glove boxes which are made in the factory and lined and covered with paper by hand. Since this results in high handling and packaging costs, it would be beneficial to the industry to devise a means by which the weight and cost of production of the containers could be reduced. 4 illustrations. M.W.

GENERAL ANILINE & FILM CORPORATION. Ansco's triple threat. Modern Packaging 24, no. 11: 88-9 (July, 1951).

A new triple-unit package for Ansco All-Weather film consists of a red, white, and blue aluminum foil wrapper sealed around a folding carton. The sealed box wrap eliminates the foil wrap on each spool of film and results in a 30% saving of foil. The exceptional protection it affords has made possible the elimination of the expiration date on the package, and special packaging for film to be shipped to other climates is no longer necessary. Additional features of convenience and economy have resulted in very favorable consumer reaction to the package. 3 illustrations. M.W.

GEO. A. HORMEL & COMPANY, *Austin, Minn.* Window with a shade. Modern Packaging 24, no. 11: 66-7, 170 (July, 1951).

A new type of package for sliced bacon provides protection from light and permits inspection of the contents. An acetate film window which is built into the top of the package is completely covered by a flap that is die cut on three sides and scored at the top to fold back like a hinge; the flap is an integral part of the semirigid paperboard outer surface of the package. 5 illustrations. M.W.

MODERN PACKAGING. Birds Eye Brand frosted foods. Modern Packaging 24, no. 11: 76-81, 170 (July, 1951).

The Birds Eye frosted food package is the unquestioned pioneer and still the leader of the frozen-foods industry. A division of General Foods Corp., Birds Eye has not only provided the prototype of all frozen-food consumer packages, but it has throughout its history made notable contributions to the improvement of packages, filling and closing machinery, heat-sealing meth-

ods, and moistureproof overwraps suitable for low-temperature storage. A recent accomplishment of Birds Eye research is an improved carton which permits a 20% reduction in the amount of paperboard used. It is paraffin coated on the outside, lined with cellophane, and provided with a waxed paper, heat-sealed overwrap. Birds Eye also pioneered the composite can now universally used for frozen fruits in syrup. The packaging, merchandising, and marketing problems involved in frozen foods have been successfully worked out by Birds Eye to provide quality products which have become a standard feature of American menus. 14 illustrations. M.W.

MODERN PACKAGING. Q M packaging—1951. Modern Packaging 24, no. 11: 59-65, 166 (July, 1951).

A description is given of some of the containers and methods of packaging which were evolved at the Quartermaster Food and Container Institute in Chicago where specifications and methods of packaging food and subsistence items for all three branches of the armed forces are developed. 1 table and 18 illustrations. M.W.

MULDOON, T. J. Method for determining best arrangement of cartons in a shipping case. Fibre Containers 36, no. 7: 92, 94, 96, 98 (July, 1951).

A procedure in use by General Foods Corp. is described for studying the most suitable arrangement of a number of cartons in shipping cases and for specifying, by means of a coding system, the exact arrangement of the cartons in the case. As a general rule, all arrangements are eliminated which have one dimension that is more than 2.5 times as great as either of the two other dimensions. Factors which have to be considered in the selection of the arrangement include: loading, sealing, handling, palletizing, Rule 41, cost, stacking strength, price marking, shape, opening, flap gap, type gap, score tearing, printing, and long and short off-center stacking. 2 tables and 2 figures. E.S.

ROYCE, CLINTON K. Impact of defense requirements in the paper and twine industry. Paper Trade J. 132, no. 26: 37-8 (June 29, 1951); Am. Paper Merchant 48, no. 7: 20, 38 (July, 1951); Am. Paper Converter 51, no. 8: 9, 46-8 (August, 1951); Tappi 34, no. 8: 112-13A (August, 1951).

A general account of the demands of packaging for Navy stores (preparation of material for shipment and storage under extreme weather conditions) is given. E.S.

U. S. DEPARTMENT OF COMMERCE. *Production and Marketing Administration.* Cherry prepackaging study. Packaging Parade 19, no. 222: 106-7 (July, 1951); *cf.* B.I.P.C. 21: 573-4.

A study is reported in which the cost of packing cherries in transparent film bags, window cartons, plastic baskets, overwrapped trays, and the conventional 15-lb. wooden box was compared. Findings based on one year's work reveal that prepackaging in transparent film bags was the least expensive, and packing in conventional wooden boxes was the second most economical method. In addition, the cherries in transparent bags sold at retail at somewhat lower prices than those in other types of containers. Some new fruit-handling devices are described which were developed as a result of an efficiency study which was conducted at the same time. 10 illustrations. M.W.

PAPER—COATED

DAPPEN, J. WAYNE. Distribution of starch in clay coatings. Tappi 34, no. 7: 324-35 (July, 1951).

A study has been made of methods for quantitatively determining the distribution of the adhesive vehicle in wet laboratory coatings of starch-clay color upon a mechanical pulp-sulfite coating raw stock, the redistribution of the starch during drying, and the distribution of starch in the dry coated sheet. There was a little migration of the starch into the base sheet. During rapid air drying, starch migrated to the top of the coating, thus producing a nonuniform distribution, with less starch at the coating-fiber interface than at the outer surface of the coating. The results of this and other studies should give information regarding the dusting, picking, and ink receptivity of coated printing papers. 1 table, 13 figures, and 9 references. E.S.

TRIST, A. RONALD. The Trist paper coating system. Tappi 34, no. 7: 96-100A (July, 1951).

The preparation of the coating emulsion (an oil-phase, resin-bearing emulsion containing finely divided water as the disperse phase), the special "kinetic colloider" for preparing the emulsion, and the Trist coater for applying the coating are described. A flexible trailing blade which acts as a scraper or doctor spreads a very thin layer of emulsion evenly on the web; the final coat can be varied from 1.5 to 7.5 pounds per ream of 3000 sq. ft. Paper of any weight or type (book, catalog, bread wrappers, labels, etc.) as well as cardboard can be coated by this method. A paper of high dimensional stability under varying atmospheric conditions is claimed to result. The method is covered by U. S. patent 2,368,176 (Jan. 30, 1945). E.S.

PAPER—COATED (HOT-MELT)

BAKELITE COMPANY. A new method for coating paper with polyethylene. Am. Paper Converter 25, no. 7: 10-11, 44 (July, 1951).

A paper-coating method is described which involves the lamination of hot, extruded polyethylene directly to paper as the film is produced by a screw-type extruder. By means of heating chambers within the walls of the screw enclosure, heat is transferred to the plastic, and it is softened to the desired extent as it rotates along the inside of the extruder. After it leaves the extruder, it is immediately stretched and laminated to paper. 1 table and 5 illustrations. M.W.

PAPER—COATED (ION EXCHANGE)

ERICKSON, D. ROBERT. Precipitation coating. Modern Packaging 24, no. 11: 107-9, 172 (July, 1951); *cf.* B.I.P.C. 19: 708.

The precipitation of a coating of hydroxyethylcellulose on paper or board raw stock produces a flexible nonthermoplastic greaseproof film. The coating method differs from other methods in that, after a normal coating operation and before any appreciable penetration, the applied liquid coating is contacted with a salt solution which undergoes ion exchange with the sodium hydroxide in which the hydroxyethylcellulose is dissolved. A nontacky solid film results. The film may be printed or dyed in much the same manner as cellophane, and it may also be filled with clay or other coating pigments, although with large amounts, greaseproofness is lost. Board and paper coated with these films can be used for paper plates, trays, and dishes, for packaging bakery goods, and for wrappers or cartons for meat and dairy products. 1 table and 7 figures. M.W.

PAPER—CONVERSION

CRAIG, F. A. Practical paper making. No. 8. The finishing of

paper. Paper & Print 24, no. 2: 188, 191-2, 194 (Summer, 1951); *cf.* B.I.P.C. 21: 705.

The finishing operations of conditioning, surfacing, damping, supercalendering, friction glazing, plate glazing, embossing, and coating are described. 3 illustrations. M.W.

PAPER—MERCHANDISING

NADELL, HENRY H. Selling against non-paper competition. Am. Paper Merchant 48, no. 7: 14-15, 43 (July, 1951).

The technique used by Ginsburg Brothers, Inc., paper merchants, to compete successfully with nonpaper distributors at the retail food store level is described. A survey conducted by company salesmen among customers who had changed to nonpaper distributors revealed that, although these distributors have operating cost advantages, the paper merchant has several advantages, such as faster and better delivery service, better sales force, wider selection of products, and cash discounts. By stressing these advantages and presenting statistics concerning investment, costs, and profits to the storekeeper in a "canned sales" approach, sales increased considerably, and the company was successful in maintaining its position in the retail food store market. 1 table. M.W.

PAPER & PAPER PRODUCTS. Now everything is in the bag—Pebco, plastic bag maker, tells why. Paper & Paper Products 92, no. 20: 1, 4-5 (July 5, 1951).

Reference is made to the increasing trend toward the packaging of all kinds of merchandise and foodstuffs in transparent envelopes and bags; although only a small proportion of the bags are paper or partly paper, the business falls naturally into the field of the paper converter and paper merchant. The activities, products, and markets of Perry Envelope and Bag Co., New York, a typical converter, are described. 1 illustration. E.S.

PAPER AND PULP INDUSTRY

STEVENSON, LOUIS T. The place of the paper industry in the United States economy. Paper Mill News 74, no. 28: 103-4 (July 14, 1951); Paper Trade J. 133, no. 2: 62, 64 (July 13, 1951); Southern Pulp Paper Manuf. 14, no. 7: 26, 30 (July, 1951).

The paper and board industry, the sixth largest industry in the United States, is essential to the country's economy and should be considered one of the most essential of all industries. As an example of the important functions of paper, the vast printing and publishing industry, packaging, and sanitary aspects are listed, although this does not cover all the uses to which paper is put. Statistical data on production and earnings are included. The industry is dependent primarily upon adequate supplies of wood and water; its products permeate the entire economy, which is dependent upon a constant flow of products from the paper industry. E.S.

PAPER AND PULP MILLS

ANON. Crane & Co. marks 150th year . . . and receives 73rd contract for currency paper. Paper Ind. 33, no. 4: 384-5 (July, 1951); *cf.* B.I.P.C. 21: 469.

In 1951, Crane & Co. celebrates its 150th anniversary; it is still actively managed by descendants of Zenas Crane, the founder of the company. In

1879 paper for currency for the government was first made by Crane; this is the 73rd consecutive year that the company has been awarded a contract for currency paper. 8 illustrations. E.S.

ANON. Longview Fibre Co., new woodroom and new machine. Pulp & Paper 25, no. 8: 84 (July, 1951).

A brief reference is made to expansions by the company, including facilities for handling chips procured from many large and small sawmills in the vicinity and a new 160-inch Fourdrinier containerboard machine. E.S.

SHORTER, ALFRED H. The distribution of British paper mills in 1851. Paper-Maker (London) 121, no. 6: 416, 418, 420, 422-3 (June, 1951).

A list of paper mills in England (296), Wales (8), Scotland (48), and Ireland (28) at work in 1851 is presented, including the number of operating and idle beating engines. The compilation was rearranged according to counties from a return according to "collections of excise" prepared for the Excise Authorities and published in *House of Commons Papers* in 1852, before the age of esparto and wood pulp. A comparison with 1951 shows that there were far more mills in the British Isles in 1851 than today and that these were also more widely scattered; from some counties the industry has subsequently been entirely eliminated. Many quite small mills with less than six beating engines each, some with only one or two engines, were in operation, and many of these have gone out of existence. E.S.

SUTLIVE, KIRK. The largest kraft paper mill in the world. Southern Pulp Paper Manuf. 14, no. 7: 38, 42, 44 (July, 1951). [Abridgment]

The Savannah plant of the Union Bag & Paper Corp. is the world's largest integrated kraft container plant; it might be described as a mass-production kraft operation in which, through the sulfate process, kraft paper, kraft paperboard, bags, and corrugated shipping containers are manufactured. The plant began operations in September, 1936 as a one-machine mill with a small bag factory attached, which employed between 600 and 700 people; today, there are five paper machines, and the plant employs 5000 people. In the 16-year history of the plant there has never been a period in which some type of expansion program has not been in progress. The current expansion projects include the addition of a new paper machine and the installation of equipment for the manufacture of semichemical pulp from hardwoods. Statistical data on the consumption of raw materials, steam, power, etc., are given, and the conservation policy of the company's forestry program is stressed. E.S.

PAPER MANUFACTURE

CURTIS, J. S. [Papermaking] Paper & Print 24, no. 2: 225-6 (Summer, 1951).

A brief description of papermaking methods is presented. M.W.

PAPER SIZING

HITCHIN, D. F. The emulsifying of rosin size and its effect on the finished paper. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 63-7 (February, 1951).

In a comparison of mill-scale sizing experiments between the use of emulsified size added to the beater in dilute form and that of size added to

the beater directly in the form in which it is received from the producer, the superiority of the former became distinctly evident, as the dispersion throughout the beater was uniform, and the "solution" of the size was complete before addition. A better and much more uniform sizing effect in the finished sheet resulted; although it is difficult to evaluate the degree of saving with emulsified size, it is obvious that savings were effected. 4 tables. E.S.

PAPER SPECIALTIES

ANON. Fan uses paper disks. Paper Trade J. 133, no. 3: 12 (July 20, 1951).

Reference is made to a fan developed by Peter Schlumbohm, the inventor of the Chemex coffee filter, which employs five paper disks on a projecting shaft of a 0.25-h.p. motor. As the disks spin, they filter dust and dirt out of the air, so that the fan not only creates a breeze, but also removes the dirt from it. After some hours of use the disks become blackened with the accumulated impurities. E.S.

ANON. Giant jobs for tapes. Modern Packaging 24, no. 11: 98-102 (July, 1951).

Recent technological developments in reinforced flexible tapes and the curtailment of the use of metal strapping in commercial packaging have resulted in the wider use of flexible tapes. The principal advantages of reinforced tapes derive from their ease of application, their great tensile strength, and their shock-absorbing properties. They can be used for sealing, reinforcing, banding, protecting, holding, and identifying cartons and other unit loads. The tapes are composed of an acetate or vinyl film or kraft paper base and are reinforced with rayon or glass filaments. Each type has its particular advantage, and selection is largely empirical. Some examples of the use of flexible tape in various types of packaging are presented. 9 illustrations. M.W.

ANON. VPI goes to war. Modern Packaging 24, no. 11: 92-5 (July, 1951); *cf.* B.I.P.C. 19: 311; 21: 31.

Vapor-phase inhibitive papers promise to find extensive use as anticorrosion agents in packing rifles and other ferrous armament materials because they provide excellent protection and eliminate the need for time-consuming cleaning operations before use. Formal government approval has recently been given to MIL-P-3420 Specification for Packaging Material, Corrosion Inhibiting, Volatile Type. The proposed vapor method for preserving and packing rifles employs individual laminated corrosion-inhibitor bags lined with VPI-coated kraft paper. Preliminary tests have shown the efficiency of this method for rifles and other iron or steel products, and the successful industrial uses of VPI paper provide additional evidence of its effectiveness. 9 illustrations. M.W.

COUCH, ROBERT DE S. Some of the newer converted packaging materials. Am. Paper Converter 25, no. 7: 12-13, 48-9 (July, 1951).

The physical construction, performance characteristics, price range, and availability of some of the coated, laminated or treated papers, and foil and film combinations which have recently been developed for packaging uses are discussed. 1 table. M.W.

FAGG, ELIZABETH. Big market for paper containers seen in hos-

pital 'hospitality' shops. Paper & Paper Products 92, no. 20: 1, 6 (July 5, 1951).

Reference is made to the sales opportunities for paper products offered by the hospitality shops or centers operated by many hospitals. 1 illustration. E.S.

MORRIS, CHARLES V. Unusual papers for special jobs offer many sales opportunities. Paper & Paper Products 92, no. 20: 1, 10-11 (July 5, 1951).

The author discusses the possibilities of unusual printing papers for highly specialized jobs and gives three examples (a paper deliberately made to curl for paper rockets and projectiles, a porous nonrattling paper for popcorn bags, and a flameproofed paper for displays); in addition, different applications of usual papers for unusual purposes are described, with emphasis on the sales opportunities they represent for the alert paper merchant and printer. E.S.

PAPER STORING

DAY, FREDERICK T. Paper storage and handling. Brit. Packer 13, no. 6: 28-9 (June, 1951); *cf.* B.I.P.C. 21: 716.

Proper storage of paper packaging materials is especially important at the present time, because the irregularity of supplies makes it necessary to maintain large stocks. Recommended storage conditions include good ventilation and freedom from dampness, dirt, heat, and direct sunlight. The use of the pallet system of storage facilitates handling and transport. It is also important that old stocks be used before the latest deliveries, and records of deliveries should be kept on stock entry cards. 3 illustrations. M.W.

PHOTOGRAPHY

HUGHES, F. P. The application of photography to papermill problems. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 77-88 (February, 1951).

The author gives several examples to illustrate the usefulness of photography in a paper mill. Following a brief description of the construction and operation of the Leica 35-mm. camera used, its application to the recording of the appearance of cylinder surfaces (corrosion problems) and the behavior of condensate inside a rotating drier drum is explained. 22 figures. E.S.

PHYSICAL TESTING—FASTNESS TO LIGHT

VAN DEN HEUVEL, E. Improvement of temperature and humidity in the Fade-Ometer. Am. Dyestuff Reptr. 40, no. 13: 397-8 (June 25, 1951).

In using the Fade-Ometer for the determination of light fastness, discrepancies occur as a result of abnormal temperature and humidity conditions in the testing chamber. Some alterations are suggested which bring the temperature and the relative humidity closer to 20°C. and 65%, respectively. Moisture-susceptible dyes tested with these changes in effect show correct results. 1 table, 1 figure, and 7 references. M.W.

PHYSICAL TESTING—PAPER

HORIO, M., and ONOGI, S. Dynamic measurements of physical

properties of pulp and paper by audiofrequency sound. J. Applied Phys. 22, no. 7: 971-7 (July, 1951).

The dynamic Young's moduli of various types of paper were measured by the vibrating reed method. The Young's modulus of paper increases statistically at a rate approximately proportional to the square of its density. The modulus and density of paper increase with the degree of beating. The sulfite and sulfate fibers behave differently during beating. The angular dependence of Young's modulus, tensile strength, and elongation at break was analyzed mathematically, and the results were verified by experiments. According to this theory, the mean value of Young's modulus and tensile strength of machine-made paper should be expressed by the geometrical mean of the values of the machine and cross-machine directions, whereas the mean value of elongation can be given by the arithmetic mean. The removal of parenchyma cells is very effective in reducing the Young's modulus of dissolving pulp. The viscoelastic properties of paper were observed within the frequency range from 20 to 180 centipoises. The dynamic modulus and mechanical loss factor of the sheets employed were found to be smaller than one tenth of those of cellulose films. The interfiber deformation influences the dynamic properties of paper. 7 tables, 10 figures, and 10 footnotes. E.S.

MORRIS, CHARLES V. Some practical pointers on paper tests and testing for paper salesmen. Paper & Paper Products 92, no. 21: 1, 8-9, 18-19 (July 20, 1951).

The significance of important paper tests is discussed in nontechnical language, including a description of grain; basis weight; the Mullen test for strength, stiffness, and rattle; tearing, folding, and tensile strength; and printability, including ink absorption, density, water absorption and penetration, tub sizing, and the Dennison wax test. In conclusion, a brief reference is made to the possibilities of microscopic and analytical testing procedures. 1 table. E.S.

PHYSICAL TESTING—PAPER—ERASURE TEST

WINK, W. A., BECKMAN, N. J., and RANEY, W. P. Instrumentation studies. LXIII. Erasability of paper. III: Progress report on a study of erasability. 2. Tappi 34, no. 7: 103-19A (July, 1951); *cf.* B.I.P.C. 21: 572.

This progress report presents (*a*) a study of the erasing characteristics of six different papers which, in effect, is a continuation of the work reported in Instrumentation Studies LXII and (*b*) a study of the various factors relating to erasability. Throughout the course of this work, the erasures were performed with an abrading machine designed specifically for this investigation. In the study of the erasing characteristics of the six additional papers, all the specimens were abraded for the number of strokes required to remove a pair of ink lines from the paper. Abraded and unabraded specimens were subsequently evaluated to determine the effects of erasure on weight loss, reflectance (R_s and R_o), gloss, and writing quality. The investigation of the various phenomena of erasure included a study of: (*a*) the performance and uniformity of 21 Calibrase abrading wheels, (*b*) the abrading rates as the erasure proceeded from the surface of the paper into the body of the sheet, (*c*) the effect of speed of the abrading stroke, (*d*) the effect of vertical thrust of the abrading wheel on the paper, (*e*) the effect of repeated erasures on erasability data, (*f*) the effect of ink composition, and (*g*) the effect of relative humidity. Coincident with the study of foregoing variables, an interesting phenomenon concerning the inherent structure of paper was dis-

covered. Strong directional effects were apparent in the erasure of some papers which are attributed to a "shingled" effect of the fibers in the sheet (the directional effects are those associated with the change from machine to antimachine direction of erasure—not from machine to across-machine direction). 11 tables, 8 figures, and 3 references. E.S.

PHYSICAL TESTING—PAPER—FOLDING ENDURANCE

BRECHT, W., and KÖRNER, L. The accuracy of the measurements obtained with the Schopper folding tester. Das Papier 5, no. 9: 155-61 (May, 1951). [In German] *cf.* B.I.P.C. 19: 864-5.

With reference to the large discrepancies in the results of folding tests obtained with the Schopper instrument and the lack of permissible tolerances in the German standard Din 53,412 (which could be used as a basis of instrument calibration), 23 different Schopper folding testers were evaluated with five different paper samples (10 tests each in the machine and cross-machine directions) which were known to possess different folding values. The procedures and the statistical evalution of the test material are described in detail. An accuracy of $\pm 34\%$ was determined as a basis for calibration. It is recommended that an instrument of superior performance, i.e., with a much lower total deviation than the $\pm 34\%$ tolerance limits, be set aside for calibration purposes only, either for comparison with other testers or for the periodic checking of the standard paper samples. Each new instrument to be calibrated should be tested with the five standard paper samples (minimum 10 tests each in the machine and cross-machine directions). 3 tables, 3 figures, and 10 footnotes. E.S.

PHYSICAL TESTING—PAPER—GLOSS

HARRISON, V. G. W., and POULTER, S. R. C. Gloss measurement of papers—the effect of luminance factor. Brit. J. Applied Phys. 2: 92-7 (April, 1951); *cf.* B.I.P.C. 19: 647.

For a range of papers of luminance factor varying from 20% upward and of gloss varying from an almost complete mat to a gloss high enough to give fair mirror images, the equation $G = S(a + 10/L)$ is proposed, where G is a measure of visual gloss, S is the relative intensity of reflected light under 45°—45° conditions of illuminating and viewing, L is the luminance factor expressed as a percentage, and a is a constant which, under the conditions used by the authors, is approximately 0.20. The visual gradings of eight papers out of ten are not markedly affected by the conditions of observation, but for the remaining two there is a highly significant shift in grading according to whether or not these conditions permit the formation of mirror images. Gloss is considered to be a "Gestalt," which corresponds to no single physical property of a surface and which is judged by appraisal of a physical situation taken as a whole. The validity of the method used in establishing the psychological gloss scale is checked by experiments in weight grading. 11 tables, 4 figures, and 1 reference. E.S.

LIEBERT, ERHARD. The measurement of the gloss of paper. Das Papier 5, no. 10: 191-4 (May, 1951). [In German]

A photoelectric glossmeter is described for measuring the gloss of a running web of calendered paper; the method is intended as a control of the smoothness produced by the calendering operation. Data on the correlation of smoothness and gloss are included. 2 tables, 7 figures, and 4 footnotes. E.S.

PHYSICAL TESTING—PAPER—MANIFOLD PAPER

KOTTE, HANS. A study for the evaluation of the quality of manifold paper. Das Papier 5, no. 10: 212-17 (May, 1951). [In German]

In evaluating the quality of carbon and manifold paper, the lack of clear, legible copies is usually immediately blamed on the carbon paper. In the present study, efforts were made to clarify the influence of the properties of the manifold paper on satisfactory typing results. A number of brands of manifold papers of different basis weight, furnish, and finish were used by the same typist upon the same typewriter for typing the identical text; either three, six, 10, or 15 copies were made at a time. The procedures and methods of evaluation are described in detail. The most important results indicate: The lettering produced by the carbon paper is the more intensive and legible, the whiter and better closed the paper surface (maximum contrast between type and background). Best results are obtained with a finish which is neither too smooth nor too rough. Very smooth papers are apt to produce flat results and to smudge on removal of the carbon papers, whereas with rough papers, the clarity of the type contours is liable to suffer. In the preparation of a few copies (three or four), a heavier manifold paper of 40 g. basis weight is preferable; however, the sixth copy of this heavy grade lacks sharpness of type. Manifold paper of 30 g. basis weight without mechanical pulp can be considered the standard type. It is satisfactory for most business purposes and possesses sufficient mechanical strength. When eight or more copies must be prepared, only basis weights of 25 g. or less should be used; a thin paper should also be selected for the original. The selection of an extra thin carbon paper in place of the standard weight does not materially improve the clarity and sharpness of the contours of the type upon the copies. When numerous copies are being prepared, it is often preferable to type without ribbon and to place a carbon paper on top of the assembly. If an original cannot be dispensed with, a genuine silk ribbon may be substituted for the usual cotton ribbon to obtain clear-cut typing results. 5 tables. E.S.

PHYSICAL TESTING—PAPER—OPACITY

POULTER, S. R. C. A simplified opacity meter for printing papers. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 281-3 (February, 1951); *cf.* B.I.P.C. 20: 805.

The construction of a simpler and less expensive instrument than the PATRA-Hilger opacimeter is described; the modification was made by Evans Electroselenium Ltd., Harlow, Essex. The EEL instrument retained as many of the features of the original as possible; it can be used by relatively unskilled workers. A comparison of the results obtained with both instruments was made by PATRA; the data indicated that the simplified opacity meter gives readings linearly related to those given by the more elaborate instrument. Although the printing-opacity figures cannot be read to the same accuracy, the EEL meter should be quite satisfactory for the routine checking of deliveries. 2 figures and 3 references. E.S.

PHYSICAL TESTING—PAPER BAGS

ALLEN, R. J. L., and PAINE, F. A. Transport trials and laboratory tests on food containers. I. Lined kraft-paper bags. J. Sci. Food Agriculture 2, no. 5: 208-17 (May, 1951).

The serviceability of kraft-paper bags lined with greaseproof paper for packaging corn flour has been assessed in statistically designed transport trials. Closely similar results were obtained by laboratory drop tests. However,

conventional strength tests on the kraft paper showed no correlation with the behavior of the bags in service. 15 tables, 6 figures, and 3 references.
E.S.

PHYSICAL TESTING—PULP—FREENESS

IVARSSON, B., and JOHANSSON, O. S. A precision apparatus for determining fluid flow through paper pulp. Svensk Papperstidn. 54, no. 11: 371-8 (June 15, 1951). [In Swedish; English and German summaries]

A brief review of the literature is presented in which the pertinent information is discussed under "drainage" (which includes most of the standard freeness testers) and "resistance to fluid flow." In the Swedish Central Laboratory a tester for the determination of fluid flow through paper pulp has been constructed, which permits sheet formation and the measurement of flow in one continuous operation. Details of the construction and operation of the apparatus are given; a provision has been made so that contact of air with the formed sheet during the test is prevented. The hydraulic pressure during the testing period (including sheet formation) is kept constant, which eliminates one variable that would otherwise complicate the evaluation of the results. When beaten pulps are tested under identical conditions, accurate readings can be taken, and the results are reproducible. The influence of different factors upon the rate of flow has been studied, and the effect of different hydraulic pressures, pulp concentrations, temperatures, and wire meshes is demonstrated. Possible practical applications of the instrument and the relationship of fluid-flow data to degrees S.-R., beating period in a Valley beater and PFI mill, and drainage time according to TAPPI Standard T 221 m-50 are discussed. 1 table, 17 figures, and 17 references.
E.S.

PHYSICAL TESTING—TACK

VOET, ANDRIES, and GEFFKEN, CLAUDE F. The nature of tack. Ind. Eng. Chem. 43, no. 7: 1614-24 (July, 1951); *cf.* B.I.P.C. 21: 720.

A study of the dynamics of tackiness of liquids in general and of printing inks in particular is reported. It was found that rapid film separation does not occur by liquid flow as previously thought, but is the result of a viscoelastic response of the liquid which may react (in varying degrees) as a solid toward rapidly applied stresses. Tack in liquid films is related to a response to stress mechanism found in long-chain molecules, characterized by a modulus of 10^6 to 10^8 dynes/sq. cm., and a relaxation time of the order of 10^{-4} second. Tack energy is the total energy necessary to cause film separations. Experiments with printing inks show the existence of a linear relationship between tack energy and film thickness which gives a value for the tack energy per unit volume referred to as tack energy density. A logarithmic plot of tack energy density against viscosity and against the reciprocal absolute temperature is a straight line. Tack energy density is also proportional to the peripheral cylinder speed, but is independent of the pressure. This work results in a physical basis for a newer conception of tackiness and in certain theoretical predictions of ink behavior on a press. 5 tables, 9 figures, and 33 references.
M.W.

PLASTICS—HONEYCOMB

ANON. Honeycomb comes of age. Modern Plastics 28, no. 11: 84-7 (July, 1951).

A honeycomb section with a thin skin or face sheet to cover the open ends makes a sandwich material which is extremely strong for its weight and extremely economical of materials. Honeycomb core can be made from paper, cotton, glass cloth, or aluminum foil. A plastic impregnant is used to make the material rigid enough for use as a sandwich core. There are two basic methods of manufacture: the corrugation method and the expansion method. In the expansion method, which is used for paper, glue lines are put on flat sheets which are then stacked, bonded to each other, and expanded to form the pattern. Military applications of paper honeycomb include semistructural panels, curtain wall panels, and some radar transmission panels. It is also used as a core material for plywood flush doors, for shipping containers, and for panels of prefabricated houses. There are innumerable uses for a low-density structural material like honeycomb sandwich, and the downward trend in the cost of the material indicates it will move into many of the possible applications. 12 illustrations. M.W.

PRINTING AND PRINTER'S INK—PLASTICS

BAKER, T. THORNE. Fluorescent inks and paints. Paper Market: 154, 156-8 (June, 1951); Brit. Printer 64, no. 379: 49-50, 62 (July-August, 1951). [Abridgment]

Following a discussion of the fundamental properties of fluorescence, the characteristics of fluorescent dyes in relation to their use in advertising is discussed. The colored dyestuffs used in poster inks are largely of the rhodamine class. In an investigation of the technology of inkmaking with fluorescent dyes it was found that emitted light increases with the molecular weight of the dye, and that fluorescence of the dye increased and its tendency to fade diminished if it was used in the form of a solid solution, for example, in urea-formaldehyde or melamine-formaldehyde resins. Examples of applications of fluorescent dyes are cited, and mention is also made of some of the inorganic substances used in general illumination, x-ray examination, and radiography. M.W.

PULP

MICHIE, R. Woodpulp: some practical and commercial considerations. Proc. Tech. Sect., Brit. Paper and Board Makers Assoc. 32, no. 1: 229-48; discussion: 249-56 (February, 1951).

The author reviews the different types of chemical, semichemical, and mechanical pulps available on the European market and the methods (including recent developments) by which they are manufactured. Reference is also made to the optimum moisture content of groundwood pulp which will allow satisfactory repulping for newsprint manufacture, fungicidal treatment of the moist pulp to check mold growth for a reasonable period (about 12 months), methods of pulp evaluation, and the need for standardization of the British and Scandinavian procedures. 9 tables. E.S.

PULP AND PAPER—IMPURITIES

CYRUS, WILLIAM F. Photographic standards for dirt control. Tappi 34, no. 7: 335-6 (July, 1951).

The methods currently available for determining the customer acceptability of paper with regard to dirt involve the time-consuming evaluation of each dirt speck. The method described in this paper involves a single comparison of the entire pulp or paper sample with a series of graduated dirt standards. These standards are photographs of simulated dirt sheets which range from dirt-free to very dirty. Although this method requires but a

few seconds, laboratory tests and mill-scale use have demonstrated its reliability in evaluating dirt in a manner similar to the way it is judged by a customer. 2 references. E.S.

WATSON, CARTER A. The sources of wood dirt in unbleached pulp. Tappi 34, no. 7: 311-13 (July, 1951).

The wood dirt in unbleached sulfite pulp varies in character and quantity depending on the wood supply and its method of preparation for pulping. Reduction of wood dirt, a necessary function in the pulping process, is accomplished by various methods. In choosing a method for more effective dirt reduction, information correlating the wood dirt with the dirt content of the final product is of considerable importance. The author describes a method whereby information on this relationship can be obtained by small-scale experiments; typical data with examples of their application to practical dirt reduction problems are presented. 3 tables, 2 figures, and 2 references. E.S.

PYRITES

FRANKLIN, J. N. The Dorr FluoSolids reactor for roasting sulphides. Pulp Paper Mag. Can. 52, no. 7: 140-1, 147 (June, 1951).

A preliminary report is given of the application of the FluoSolids method to high-sulfur content ores at Red Lake, Ont., where the process is installed for recovering the calcine and not for the production of sulfur dioxide; the generated gases are waste products. The process consists of admitting a slurry containing 80% finely divided ore and 20% water to a refractory-lined steel reactor. The resulting ore bed is supported on a perforated constriction plate through which air is pumped under a pressure of 3 to 4 p.s.i. This causes the whole bed to be fluidized and act as a fluid mass in constant violent ebullition. The initial ignition is obtained by an auxiliary oil burner, after which roasting will continue as long as the sulfur content of the ore is above 12%. From the reactor the gas containing 20-40% of the total calcine passes to two or more cyclones. Here, most of the calcine dust is removed and passed to a quench tank where it joins the calcine drawn off continuously from the main reactor bed. Modifications of the process for adapting it to the needs of a sulfite mill are mentioned. The three main problems facing the sulfite industry when considering the installation of such equipment involve: the type of pyrite available and its handling and storage, the actual design of the equipment, and the disposal of calcine. 1 illustration. E.S.

RAYON—STATISTICS

RAYON OR'GANON. World rayon production. Rayon Or'ganon 22, no. 6: entire issue (June, 1951); *cf.* B.I.P.C. 20: 898-9.

Almost the entire issue is devoted to statistical information on world rayon production, including tables and diagrams and a list of rayon producers. The world production in 1950 amounted to 3494 million pounds, an increase of 29% over 1949, of which viscose accounted for 73.5%, acetate for 23.5%, and cuprammonium for 3%. Cotton continued as the most important textile fiber and amounted to 68% of the total three-fiber output of the world, followed by rayon with 19%, and wool with 13%. Silk production was only nominal. E.S.

RESEARCH LABORATORIES

ANON. The Printing, Packaging, and Allied Trades Research Association. Chemistry & Industry no. 26: 542 (June 30, 1951).

A brief history of PATRA is presented, and the activities of its two divisions (Printing and Packaging) are outlined under the three principal headings: information service, advisory service, and research. E.S.

JENSEN, WALDEMAR. The activities in 1950-1951 at the Institute of Wood Chemistry at Åbo Akademi. Paper and Timber (Finland) 33, no. 4a: 163-5 (Special issue, April, 1951). [In Swedish; English summary] *cf.* B.I.P.C. 21: 112.

The report covers research work carried out at the institute during the past year, with particular reference to the chemistry of birchwood, new equipment, and the occupation of a new building. 1 illustration. E.S.

SAFETY

SHEA, JAMES R., SR. Safety works. Paper Trade J. 133, no. 1: 20-2 (July 6, 1951).

The successful reorganization of the safety program at the Tyrone mill of the West Virginia Pulp and Paper Company is described. 1 table and 5 illustrations. E.S.

SALESMEN AND SALESMANSHIP

BECKETT, WILLIAM. Is the superintendent a salesman? Paper Mill News 74, no. 28: 121-2 (July 14, 1951); Paper Trade J. 133, no. 2: 77-8 (July 13, 1951).

The author discusses the manner in which a superintendent can make his job more effective and more pleasant for everyone by resorting to the techniques and devices of a salesman in his dealings with his direct subordinates and employees in general, his superiors, and the customers of his mill. E.S.

FIELD, G. E. Development takes cooperation. Tappi 34, no. 7: 12A, 14A, 16A (July, 1951).

The author stresses the importance of selling ideas and enthusiasm in development work for fostering the necessary co-operation between development and production departments. Examples from GR-S production are given to illustrate the points the author wishes to emphasize. E.S.

SEMI-CHEMICAL PULPING PROCESS

MCGINN, E. P. Bathurst conservation measures. Paper Trade J. 132, no. 26: 19-20, 22-33 (June 29, 1951); *cf.* B.I.P.C. 21: 802.

A profusely illustrated account of the new semichemical mill, woodlands operations, wood handling at the mill, the new containerboard machine, and power plants at Bathurst, N.B. is given. E.S.

PULP & PAPER. New Bathurst mill; "BCM" has two important meanings. Pulp & Paper 25, no. 8: 64, 66, 68, 71 (July, 1951); *cf.* B.I.P.C. 21: 802.

An illustrated description of the new semichemical pulp mill at Bathurst, N.B. is given. 1 map, 1 flow diagram, and 5 illustrations of the equipment. E.S.

SUTHERLAND, DOUGLAS G. Sutherland high-yield sulphate

process. Fibre Containers 36, no. 7: 56, 58 (July, 1951); *cf.* B.I.P.C. 21: 579-80.

Reference is made to the development of the high-yield semichemical kraft process developed by D. Manson Sutherland, and the results obtained with it at Bathurst (*cf.* B.I.P.C. 21: 579) and Port St. Joe (*cf.* B.I.P.C. 21: 579, 647). Work is now in progress for extending the principles of this process into the lightweight paper field and into bleached grades. 1 diagram. E.S.

SETUP BOXES

MOORE, W. CLEMENT. Setup paper box survey indicates 1950 sales up 13.26 percent. Boxboard Containers 69, no. 703: 26-7 (July, 1951). [Abridgment]

According to the 26th national survey of the setup paper box industry, total sales for 1950 exceeded those of 1949 by $6,459,776.90 or 13.26%. Profits after taxes for 1950 were 5.21% of sales, as compared with 3.93% in 1949. Although profits were increased, prices did not keep up with rising costs. The survey indicated the following average percentages of material costs in setup box manufacturing: board 52.8%, paper 26.3%, and other materials (glue, twine, etc.) 20.9%. 4 figures and 2 tables. M.W.

SHIPPING CONTAINERS

GEISLER, WILLIAM, and GROENDYK, JAMES. Collapsible rubber cleated paperboard container. Packaging Parade 19, no. 222: 13 (July, 1951).

A collapsible paperboard container is described in which modified rubber collar buttons are used as the final closure fastening. The wearing surfaces of the fiberboard are protected by rubber cleating against abrasion and collapse caused by moisture. The container, which was developed at the Lorraine Manufacturing Corp., Maywood, N.J., is currently being tested as a returnable carrier for the shipment of explosives between powder and loading plants. 2 illustrations. M.W.

SHIPPING CONTAINERS—LOSS AND DAMAGE CLAIMS

HOKENSON, L. N. Role of packaging in perfect shipping. Fibre Containers 36, no. 7: 37-8 (July, 1951).

Defective solid-fiber and corrugated boxes or closures caused about 6.9% of the damage to freight, as revealed by a recent study. Until such time as there is a noticeable improvement in the other causes of damage, it is important that the existence of hazards be recognized and the packaging be improved accordingly. To accomplish this goal, the importance of the interior protection and the arrangement of the padding must be realized; these are often much more vital than the container, although too often it receives most of the attention. However, the proper design of the package is not enough to insure damage-free shipments; the use of the packaging materials must be properly followed through. Some of the important factors in this field are: adequate specifications; clearly written, understandable descriptions of their application; good closure; sufficient identification; and package inspection. The performance tests may include a cycle of simulated shipping and handling tests which are briefly outlined. Although the discussions in this article are principally directed toward the shipper, it is recognized that only a combination of better packaging, better handling, and better shipping will result in drastic loss and damage reductions. 1 table. E.S.

SPIEGEL Inc., *Chicago*. Spiegel packaging progress exhibit. Fibre Containers 36, no. 7: 52, 54 (July, 1951).

With reference to an exhibit of packaging used four years ago by the Chicago mail-order house and contrasted with the methods in use today, the six-step quality-control program of the firm is briefly outlined. Tabulated data of the percentage loss of a number of commodities shipped in the old and new packages are included. 1 illustration and 1 table. E.S.

SILICATE OF SODA

HERTZMARK, E. M. Operation of the single facer with sodium silicate. Tappi 34, no. 7: 86A, 88A, 90A (July, 1951); Fibre Containers 36, no. 7: 43-4 (July, 1951).

Directions for the correct application of straight sodium silicates on pressure-type single facers are given. E.S.

SLIME PREVENTION

BUCKMAN, STANLEY J., and HENINGTON, VIRGINIA. A new method of detecting slime in pulp and paper. Tappi 34, no. 7: 302-5 (July, 1951).

The preparation and use of a ninhydrin indicator solution (Bulab Slime Indicator) for the detection of slime in pulp and paper is described. The test is based on the determination of protein which is always present in microorganisms and not generally present in uncoated paper. 6 figures and 3 references. E.S.

STARCH

GOODISON, D., and HIGGINBOTHAM, R. S. The fractionation of starch. Part VI. The fractionation of amyloses. J. Textile Inst. 42, no. 6: T249-73 (June, 1951).

A general method for the fractionation of amyloses has been developed, which is based on the discovery that their fractional solubilities in water saturated with butanol are functions of temperature and molecular size over a small temperature range; the method has been applied to sago and tapioca amyloses. The rigidities of aqueous gels of the fractions and the intrinsic viscosities and number-average D.P.'s of their triacetates have been determined and compared with corresponding data for one sample of maize amylose and two samples of maize crystalline amylose. The relations between intrinsic viscosity and D.P. and gel rigidity and D.P. differ for the different amyloses. These differences suggest that the amyloses may be slightly branched, and that the amount of branching varies from one to another. 13 tables, 9 figures, and 36 references. E.S.

HIGGINBOTHAM, R. S. The fractionation of starch. Part V. The determination of the molecular weights of the triacetates of amyloses and amylose fractions by osmotic pressure measurements. J. Textile Inst. 42, no. 6: T235-48 (June, 1951); *cf.* B.I.P.C. 20: 666.

The essential requirements for accurate osmometry are discussed, and an improved form of osmometer is described. The results of measurements on solutions of the triacetates of samples of pure amylose and two series of fractions, from sago and tapioca amylose respectively, are reported. For

most of the work the solvent was nitroethane, but in a few cases, chloroform or 1-nitropropane was used as well. Nitroethane and nitropropane gave the same value of $(\pi/c_2)_{c_2 \to 0}$ (I), in which π represents osmotic pressure, and c_2 the concentration. The values obtained with chloroform differed from those with nitroethane, but at 25°C. the ratio of (I) in chloroform to that in nitroethane was constant over a wide range of molecular weights and equal to 1.25. Possible causes of the discrepancy are discussed. 7 tables, 2 figures, and 16 references. E.S.

HOBSON, P. N., WHELAN, W. J., and PEAT, STANLEY. The enzymic synthesis and degradation of starch. Part XIV. R-enzyme. J. Chem. Soc.: 1451-9 (June, 1951); *cf.* B.I.P.C. 21: 649.

An enzyme (R-enzyme), which catalyzes the scission of branch links in amylopectin, has been isolated from the potato and the broad bean as a stable amorphous powder. It is shown that R-enzyme operates by a purely hydrolytic process and that, unlike Q-enzyme, it has no link-synthesizing function. It is a "debranching" enzyme with respect to the predominant type of branch linkage in amylopectin, the 1,6-glucosidic link. It neither makes nor breaks chain-forming 1,4-links and has no action on amylose (synthetic or natural) or on the linear dextrins related to amylose. A convenient method of estimating the activity of R-enzyme is based on the fact that its action on amylopectin or limit β-dextrin is accompanied by a rise in the iodine-staining power of the substrate. 12 tables and 3 figures. E.S.

HODGE, J. E., KARJALA, S. A., and HILBERT, G. E. Methylation and ethylation of corn starch, amylose and amylopectin in liquid ammonia. J. Am. Chem. Soc. 73, no. 7: 3312-16 (July, 1951).

To obtain completely methylated cornstarch fractions without severe degradation of the polyglucose chains, the authors adapted Freudenberg's ammonia procedure (*cf.* B.I.P.C. 9: 217). The cause of the degradation produced by Freudenberg's method was established, and a way of avoiding it was found. Trimethyl ethers of cornstarch, amylose, and amylopectin of high intrinsic viscosity were prepared. Contrary to the findings of Freudenberg and Boppel, trimethylamylose is distinctly different from trimethylamylopectin in appearance, melting range, iodine sorption, viscosity characteristics, solubility, x-ray diffraction pattern, resistance to grinding, and film strength. Trimethyl cornstarch was fractionated into trimethylamylose (25%) and trimethylamylopectin (75%) by means of their different solubilities in diethyl Cellosolve. Triethyl ethers of cornstarch, amylose, and amylopectin were prepared for the first time. The disorganizing effect of liquid ammonia on starch granules was used to prepare dry granular starches dispersible in water. The use of this ammonia-treated starch allowed the omission of autoclaving in the starch fractionation procedure of Schoch (*cf.* B.I.P.C. 13: 249). 3 tables and 16 footnotes. E.S.

STEPHENSON, EDWARD E., JR. Potato starch in papermaking processes. Part 2. Paper Ind. 33, no. 4: 413-16 (July, 1951); *cf.* B.I.P.C. 21: 804.

The use of starch in the surface sizing of paper is discussed, as well as its application as a coating adhesive and for corrugating, laminating, and sealing operations. The properties of potato starch which are inherently different from other starches available in industrial quantities are outlined. 5 tables, 2 figures, and 19 references. E.S.

VANDER MEULEN, C. R. The use of starch adhesives on the

single facer in the manufacture of corrugated board. Tappi 34, no. 7: 80A, 82A, 84A, 86A; discussion: 86A (July, 1951); Fibre Containers 36, no. 7: 43 (July, 1951).

The author discusses the basic starch formula used in the manufacture of corrugated board, the additives caustic soda and borax, viscosity, spread, starch for waterproof coating, and defects and their causes, grouped under the headings adhesives, paper, and mechanical. E.S.

STATISTICAL METHODS

RENNER, MAYNARD S. Why a statistician? Tappi 34, no. 7: 92A, 94A (July, 1951).

The author discusses the advantages to be derived from the planning of laboratory experiments with the aid of an expert in statistics. E.S.

STEEL STRAPPING

PERRY, A. N. How paper mills conserve steel strapping. Paper Trade J. 133, no. 1: 19-20 (July 6, 1951).

Directions for the elimination of waste in the cutting and application of steel strapping are given. 1 table and 2 figures. E.S.

STREAM POLLUTION

HORLOCK, A. B. Reduction of the B.O.D. of paper trade effluents. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 1: 68-76 (February, 1951).

The author discusses the limitations of the B.O.D. test to paper trade effluents, with reference to improved results obtained by the use of a standard synthetic dilution water as adopted in America, and the possibilities of B.O.D. reduction by biological methods (percolating filters) and by settling. The data are based on experiments carried out at the laboratories of the British Paper and Board Industry Research Association. The importance of the subject with reference to the new Rivers (Prevention of Pollution) Bill now before the British Parliament in stressed. 3 tables and 7 references. E.S.

SULFITE MILLS

ANON. Celanese Corporation of America. Pulp Paper Mag. Can. 52, no. 7: 123-4 (June, 1951).

A brief description of the numerous activities of the parent organization of Columbia Cellulose Co., Ltd. is given. E.S.

EVANS, JOHN C. W. Columbia Cellulose. Pulp Paper Mag. Can. 52, no. 7: 98-122 (June, 1951); *cf.* B.I.P.C. 21: 805-6.

A comprehensive, profusely illustrated account of the different departments of the new sulfite mill of Columbia Cellulose Co. Ltd. at Prince Rupert, B.C. is given. E.S.

FORTUNE, T. M. The city of Prince Rupert. Pulp Paper Mag. Can. 52, no. 7: 125-6 (June, 1951).

Prince Rupert started as a fishing hamlet at the turn of the century; it underwent a phenomenal growth during the last war when it was used as a depot for both men and materials for shipments to Alaska and the Aleutians

At the height of this activity, the town had a population of 27,000, as compared with 5500 in 1940. The population dropped rapidly at the close of the war; its present population is approximately 12,000. The completion of the sulfite mill has provided the city with its first major manufacturing industry. 4 illustrations. E.S.

SULFITE PROCESS

HART, J. S., and STRAPP, R. K. Sulphite studies—the influence of cooking variables. Parts I and II. Pulp Paper Mag. Can. 52, no. 7: 148-54 (June, 1951).

A comprehensive investigation of the cooking variables involved in sulfite pulping was undertaken at the Pulp and Paper Research Institute of Canada at the request of the Sulphite Committee of the Technical Section. The present report comprises the first two parts of the studies. Part I deals with some exploratory work on the influences of combined sulfur dioxide, free sulfur dioxide, and digester pressure. Part II deals with a more detailed study of the influence of digester pressure and temperature on pulp yield and quality. Other variables will be studied as the Institute program permits, and reports of these studies will be presented at future meetings of the Technical Section. The results of the present studies may be summarized as follows: Combined sulfur dioxide in excess of amounts required for delignification buffers the reaction, and an amount equivalent to approximately 5% of the weight of the ovendry wood gives good results for the spruce-balsam mixture used. Free sulfur dioxide has no noticeable effect on pulp yield and quality for any fixed digester pressure, provided penetration is assured. The effect of variations in digester pressure on total cooking time to produce the same delignification is pronounced. However, there is no noticeable trend of variation in either pulp quality or yield with changes in pressure. The influence of digester pressure on the rate of reaction is related to the differences between digester pressure and steam pressure for any given temperature and is attributed to the partial pressure of the sulfur dioxide. 4 tables and 8 figures. E.S.

WATE, G. K. Independent sulphite digester relief gas recovery system. Can. Pulp Paper Ind. 4, no. 7: 6-7, 14 (July, 1951).

The independent digester-relief gas recovery is described which is at present being put into operation in the sulfite department at the Powell River Company mill. Prior to the change-over, digester low-pressure relief and accumulator overgas were passed through acid storage tanks, and the unabsorbed gases were relieved to the suction side of the fan which feeds cooled gas from the sulfur burner to the Jenssen two-tower lime rock system which produces the raw acid. With increased sulfite pulp production, the economical operating limit of the lime rock towers, particularly during periods of digester relief, was exceeded as evidenced by the appreciable escape of sulfur dioxide in the tower exhaust; this was at times in excess of 5% of the output from the sulfur burner. The installation of a gas-recovery system to function independently of the raw-acid producing facilities was therefore undertaken as a means of reducing such losses and to provide improved control of cooking-acid composition and uniformity. The new relief gas recovery system consists essentially of a pressure-recovery tower and an atmospheric tail-gas tower to absorb digester low-pressure relief and accumulator overgas. This removes from the raw-acid plant the extremely variable relief gas load and reduces the magnitude of fluctuations in the operation of the sulfur burner and Jenssen towers. Details of the installations are given, supplemented by a flowsheet. Since the relief system is not yet complete, no data on its performance can be given. 1 flowsheet. E.S.

SULFITE PROCESS—AMMONIA BASE

BISHOP, F. F., and HONSTEAD, J. F. Ammonia-base sulphite pulping liquors—their preparation and analysis. Tappi 34, no. 7: 318-23 (July, 1951).

The Palmrose method for determining sulfur dioxide in sulfite cooking liquors has been combined with the formaldehyde titration method for determining ammonia. Using one sample of liquor it is possible to obtain total sulfur dioxide, free sulfur dioxide, and ammonia. The levels of ammonia concentrations are not explicitly given in previous work on ammonia-base liquors. The potassium iodate used in the Palmrose method converts sulfites to sulfates which will react with formaldehyde to produce sulfuric acid and this, in turn, can be titrated with a base to give equivalent ammonia. The procedure cannot be reversed on account of addition products formed when sulfites are added to the aldehyde. An apparatus has been set up to study some of the variables encountered in preparing the liquors. Data are presented which show the correlation between pH values obtained in a closed-batch recycle system and analyses as obtained by the above procedures. The use of pH meters in measuring and controlling ammonia concentrations is not recommended; there is more promise for them during the sulfur dioxide absorption phase both in acid and neutral solutions. 4 tables, 6 figures, and 12 references. E.S.

SULFITE WASTE LIQUOR

HARE, JOHN H., and BAKER, BRUCE E. The precipitation of whey proteins using waste sulphite liquor. Can. J. Technol. 29, no. 7: 332-6 (July, 1951).

The process of Wallerstein and co-workers (*cf.* B.I.P.C. 15: 34-5) using spent sulfite liquor for the separation of protein from wheat mashes after fermentation was employed for recovering whey proteins. The whey does not have to be heated nor the pH of the whey adjusted when it is a by-product in the manufacture of acid-coagulated casein. The lignin-protein complex can be separated easily from solution and readily dried. Attempts to isolate the whey proteins from the lignosulfonate complex have been unsuccessful. The method seems to be a more convenient means of recovering whey proteins than the heat coagulation method when it is to be used as a protein supplement in animal feeding. Preliminary rat-feeding tests indicated that the lignin-protein complex could be well tolerated when it supplied 10% of crude protein in the diet. 3 tables, 2 figures, and 3 references. E.S.

SAGOSCHEN, J. A. Beech spent sulfite liquors as a raw material for tanning extracts. Leder 2, no. 2: 25-9 (February, 1951). [In German]

A tanning material has been developed from beech spent sulfite liquor (I) by the Austrian firm Hausruck-Extrakte, which is obtained from a rayon-type cook in which a low calcium-content cooking acid is used. With beechwood, the maximum combining value of the liquor is not reached until near the end of the cook. Thus (I) from the manufacture of paper-grade pulp is inferior to that produced from rayon pulp. A cooking acid with a low calcium content favors hydrolysis of the lignosulfonate-carbohydrate complex and thereby increases the yield of tanning material. The liquor must be purified to reduce the content of iron and calcium. Digester-strength liquor suffers a loss in combining value on standing and must, therefore, be concentrated or dried quickly. Derivatives of sulfonaphthylamine may be used to stabilize the liquor. Hausruck extract alone produces an empty, flat

leather which is hard and brittle. However, blends containing up to 30% of the extract produce leather comparable to straight vegetable-tanned leather. The use of the extract offers advantages in that it disperses the insolubles in the vegetable extracts. 3 tables, 2 figures, and 7 references.
M.A.B.

SULFUR

ANON. Anhydrite fights Britain's sulphur shortage. Chem. Eng. 58, no. 7: 212, 214 (July, 1951).

British industrialists are investing approximately $10 million in a sulfuric acid plant at Merseyside similar to the Billingham plant of Imperial Chemical Industries where anhydrite which is minded on the premises is used to produce 100,000 tons per year of 100% sulfuric acid. The new plant will begin producing 150,000 tons annually within two years. The process employed involves heating together anhydrite, sand, coke, and ashes which contain alumina, the evolution of sulfur dioxide and the formation of a cement clinker, and the conversion of sulfur dioxide into sulfuric acid in a conventional contact plant. Approximately 1.64 tons of anhydrite are consumed in the simultaneous production of 1 ton of acid and 1 ton of cement clinker. 2 illustrations.
M.W.

CANADIAN CHEMICAL PROCESSING. More about the sulphur shortage. Can. Chem. Processing [previously Can. Chem. Processing Inds.] 35, no. 6: 493-6 (June, 1951).

The reasons for the current sulfur shortage and the future outlook are discussed, and data on domestic and world sulfur production are presented. 3 tables.
M.W.

CHEMICAL ENGINEERING. Big sulphuric output aggravates a shortage. Chem. Eng. 58, no. 7: 279 (July, 1951).

Although brimstone sulfur shipments to domestic customers have been cut to 85% of the amount they received during the year ending September, 1950, sulfuric acid production is approaching a new high. This indicates that consumers are using up stocks, and unless action is taken to cut consumption, reduce exports, and increase acid-recovery practices, the sulfuric acid industry will be unable to maintain the present rate of production. The consumption of sulfur is being regulated by government allocation through NPA order M-69, which restricts the amount of sulfur available to consumers to a percentage of the base period.
M.W.

FREEPORT SULPHUR COMPANY. Facts about the sulphur shortage. Tappi 34, no. 7: 70A, 72A, 74A (July, 1951).

The reasons for the world sulfur shortage and means for its alleviation are discussed. In 1950, fertilizers consumed about 34%, and pulp and paper approximately 7% of the United States output. 5 tables.
E.S.

PULP & PAPER. Sulfur situation; developments in U. S. and Canada. Pulp & Paper 25, no. 8: 38, 40 (July, 1951); *cf.* B.I.P.C. 21: 734.

Reasons for the shortage and ways and means to alleviate it are discussed.
E.S.

VOCABULARY, TECHNICAL

DAY, FREDERICK T. ABC index to papers, boards and trade

terms. Paper & Print 24, no. 2: 197-8, 201-2, 204 (Summer, 1951); *cf.* B.I.P.C. 21: 715.

In the third part of the index, terms from galley proofs to paper sacks are defined. M.W.

WAGES

ANON. Holidays with pay. Indian Pulp and Paper 5, no. 10: 432-3 (April, 1951).

A comparison is made of the conditions which govern paid holidays and the average number of holidays per year in India, the United Kingdom, the United States, Canada, Australia, France, Argentina, and Russia. The total number of paid holidays in India is 29, which is much higher than any of the other countries considered, where the average of the total holidays is between 16 and 17 days. 1 table. M.W.

WELDING

LYTTON, C. W. How Hammermill cuts maintenance costs with electric welding. Paper Ind. 33, no. 4: 398-9 (July, 1951).

Several examples of electric arc welding in maintenance practice are given, including applications to white water trays, pipe graduations and bends, railroad pulp-car ends, and doorways and column bases where jitney traffic is heavy. 6 illustrations. E.S.

WET STRENGTH

GÖRNHARDT, LUITGARD. Experiences in the application of melamine resins for the manufacture of wet-strength papers. Das Papier 5, no. 10: 209-12; no. 11/12: 256-60 (May, June, 1951). [In German]

In the first part of the article, the present status of melamine-resin applications for wet strengthening paper is discussed, including preparation and analysis of the resin, solution process, aging, application, cure and mechanism of the wet-strengthening effect (I), and analysis of the finished paper. In the second part the results of preliminary experiments are reported which aimed to provide data on the amount of resin required and possible (I) obtained under different working conditions. The resin used was the German brand "Madurit M 4 concentrated powder" supplied by the Cassella company at Mainkur, which was added to bleached, unbeaten (unless otherwise stated), spruce sulfite pulp. The principal conclusions of the study were: The amount of hydrochloric acid (II) and the aging period are of decisive influence upon (I). It is not economical to work with aging periods of less than eight to 10 hours, whereas they may be extended to three to four days without adverse effects. The dosage of (II) must be very accurate, because the most effective quantity is the one at which the solution is still just stable; lesser quantities of (II) do not give stable solutions and, with larger amounts, (I) decreases rapidly. The heat treatment of the resin solution also exerts an effect on its properties. Long standing at high temperatures, before or after addition of (II), decreases its efficiency. Standing before acidification seems to be more harmful than after the addition of (II). It is therefore recommended that the resin solution after complete dissolution be cooled to 70°C. (the optimum temperature for adding the acid) as rapidly as possible and that the cooling be continued after acidification until room temperature is reached, at which stage the aging process may be safely allowed to proceed. The magnitude of (I) depends upon the amount of Madurit

added up to a certain limiting value, beyond which it cannot be raised significantly. However, the economic limit is reached before the saturation stage. It may be assumed that this limiting value varies with different pulps and stock-preparation procedures; in the present case it amounted to 2-3% (based on the dry pulp). The curve for Madurit deposited upon the fiber and retained by it assumes a similar shape, i.e., an identical saturation stage is reached, and the percentage of the yield decreases. The full effect of the resin addition can only be realized by allowing a sufficiently long curing period at a sufficiently high temperature; storage at room temperature has only a slight effect upon (I) and would require comparatively long periods to show significant results. 1 table, 11 figures, and 14 references. E.S.

HANSEN, OTTO. The influence of beating upon colloidal melamine-resin solutions. Das Papier 5, no. 9: 161-2 (May, 1951). [In German]

In the discussion of the paper by Wilfinger (*cf.* B.I.P.C. 21: 500), the author expressed the supposition that, on beating urea and melamine resins with the stock, the particle size of the colloids increases to the extent that the coarse agglomerates of the resins lose their colloidal character and, hence, their substantivity to the cellulose fiber. Three photomicrographs are presented which confirm this assumption. Melamine resin (4% of the German brand Madurit M 4 concentrated powder) was added in the beater to bleached sulfite pulp of approximately 15° S.-R. and a consistency of 2.5%, whereupon the beating degree immediately rose 2.5°. The entire beater charge was then beaten to 45°, which resulted in the formation of small knots (beginning at 32°) which were visible to the naked eye and consisted of fibers glued together with coarse melamine particles. Sheets of 80 g. basis weight prepared from this pulp suspension upon the Rapid-Köthen sheet machine showed distinctly the agglomeration of many resin particles which caused spots in the finished paper, although some of the resin was still deposited upon the fibers as a fine film. In another case, Madurit was added at the conclusion of the beating process at approximately 45° and allowed to circulate with the stock in the beater with raised beater roll. Even in this case the strengthening effect of the melamine decreases considerably; the wet-rub strength is still satisfactory, whereas dry strength is hardly increased and wet strength is much lower than that obtained with the resin added in the usual manner, i.e., at the conclusion of the beating process. 3 photomicrographs and 3 references. E.S.

WHEELER, GORDON W., BORDERS, ALVIN M., SWANSON, JOHN W., and SEARS, GEORGE R. The development of wet strength in neoprene-containing papers. Tappi 34, no. 7: 297-301 (July, 1951).

The results of several laboratory experiments made to investigate some of the variables which influence the development of wet strength in paper containing neoprene are presented. It is shown that the amount of alumina associated with the neoprene is important to the development of wet strength in paper. Best wet-strength results are obtained when the alum to neoprene ratio is maintained at 0.2 or above. The adjustment of alumina-flocculated neoprene to alkaline pH values for brief intervals does not influence the wet strength, but longer intervals (several days) at a pH of 8.0 appear to be detrimental to the development of wet strength. After wet strength has developed in the sheet, the alumina has served its purpose and may be removed without impairment of wet strength. Wet strength begins to develop in a sheet containing neoprene only after most of the water has been removed and a major part of the dry tensile strength has developed. The rate of

development of wet strength increases with decrease in moisture content and with increasing temperature. 5 tables, 5 figures, and 1 reference. E.S.

WHITE WATER

NEMEROW, N. Fiber losses at paper mills—effects on streams and sewage treatment plants. Sewage Ind. Wastes 23, no. 7: 880-3 (July, 1951).

There are 40 paper mills in New Jersey discharging fibrous wastes into streams and sewerage systems. Surveys show that fiber losses may be as high as 4% (80 lb./ton of product) for paperboard, 25% (500 lb./ton) in tissue mills, and 20% (400 lb./ton) in other specialties mills. Savealls and sedimentation units which separate the longer fibers may result in total suspended solids removals varying from 20 to 70%. Chemical coagulation of the waste may remove 80 to 90% of the suspended materials in board mills. Removals up to 65% may be effected by vacuum and flotation equipment in tissue and other specialty mills. The discharge of fibrous mill wastes into municipal sewage systems results in excessive quantities of sludge to be handled and in operating difficulties. When the paper waste is pretreated and mixed with sewage, it does not interfere with settling, oxidation, or digestion units, provided sufficient plant capacity is available to handle the additional load. 4 references. E.S.

WOOD

PÖYHÖNEN, K. Why short pulpwood lengths are used in western Finland. Paper and Timber (Finland) 33, no. 4a: 155-7 (Special issue, April, 1951). [In Finnish; English summary]

Pulpwood in 1-m. lengths was adopted as the standard in western Finland when transport by rail was gaining in importance, and equipment for floating and sorting long wood was not available. It was not until about 15 years ago that barges were replaced by bundle rafts in lake transport. This change necessitated the selection of the 2-m. length in addition to the shorter size. The new length was found to be more convenient in land transport too; studies by the Central Association of the Finnish Woodworking Industries have proved that the handling of 2-m. length pulpwood is 30% more efficient. In spite of this fact, it has not been possible to dispense with the shorter length entirely, because the barking drums of the mills cannot remove the bark efficiently from 2-m. pulpwood which has not been floated. Hence, 2-m. pulpwood is currently used in western Finland when it can be floated, and the shorter size in all other cases. 1 figure. E.S.

RONKANEN, A. J. The influence of wood handling and transition storage in the forest on the quality of pulpwood. Paper and Timber (Finland) 33, no. 4a: 140-8 (Special issue, April, 1951). [In Finnish; English summary]

In Finland it takes one to four years before the pulpwood reaches the wood yard from the forest. During this long period rot fungi in particular may lower its quality and quantity. Directions are given for preventing losses from this source. Standard piling of the wood in the forests should not continue when the temperature reaches 8°C., and crosswise stacking not at temperatures higher than 13°. The crosswise stacking immediately after barking lengthens the cutting season until the end of June and permits the cut to begin two weeks earlier in the fall than otherwise. Bolts containing less than 28% water (based on their dry weight) do not suffer seriously from decay, even if they are infected. However, if these bolts are floated and placed in the above-water sections of the rafts or bundles and then are

exposed to poor drying conditions at the wood yard, the latent fungi rapidly begin to grow and cause decay of the wood. This calls for protection of pulpwood (which will be floated) against infection as early as the cutting stage and prevention of fungal growth at the shore and mill-storage sites. No pulpwood should be cut in July and August unless the wood is to be used the following winter and color does not affect the quality, such as pine sulfate, sulfites used for fodder cellulose, etc. Pulpwood should not be stored in piles in the forests for more than one summer, as it often becomes wet in small storage sites deep in the woods and infected. Large transition storage sites which are generally situated in open places are preferable, because they offer much better storage conditions. Pulpwood cut in lengths of 1.5 m. or more should be stacked crosswise in transition storage; this calls for firm timber foundations. 8 figures. E.S.

SIHTOLA, HEIKKI. The length of pulpwood from the pulpmaker's viewpoint. Paper and Timber (Finland) 33, no. 6: 214-17 (June, 1951). [In Finnish; English summary]

Without taking into consideration the aspect of logging costs for pulpwood of different lengths, the Finnish pulpmaker of today prefers to receive his pulpwood in 2-m. lengths and in completely clean-barked condition. The reason is that the machinery of most Finnish chemical pulp mills is built for this length. In Sweden, depletion of forests has proceeded to the extent that all available wood must now be utilized to the last inch; the pulp mills have therefore found it necessary to change their equipment so that they can handle bolts of all lengths and dimensions up to thin tops, 2-3 in. in diameter. It seems that at present there is still sufficient timber in the Finnish forests so that the pulpmaker can demand delivery of his pulpwood in 2-m. lengths. However, it is quite probable that the production capacity of the country will be increased, and in the not too distant future, Finland will be faced with the same situation which now prevails in Sweden—i.e., that the logging of pulpwood depends on the available timber and not on the orders of the pulp mill. The author advises all Finnish sulfite and sulfate mills to take these factors into account by renewing their machinery and equipment gradually and in good time so that they will be able to store and handle pulpwood of all lengths before the necessity arises for doing so. 2 tables. E.S.

VARIS, TAPIO. Why are long lengths used in cutting pulpwood in eastern Finland? Paper and Timber (Finland) 33, no. 4a: 152-5 (Special issue, April, 1951). [In Finnish; English summary]

The author discusses the reasons for using pulpwood in lengths of 3 m. and more in eastern Finland, although shorter lengths are also consumed. The principal reasons are the practice in Sweden where long pulpwood is commonly used, and improved floating, bundling, piling, and sorting conditions resulting from the longer wood; marking and counting are also simplified. The author emphasizes the need for a detailed study of the problem, after which practical conclusions should be drawn. 5 tables. E.S.

WEGELIUS, TH. Mill storage of pulpwood. Paper and Timber (Finland) 33, no. 6: 218-21 (June, 1951). [In Finnish; English summary]

The ideal solution to the problem of storing chemical pulpwood at the mill would be the immediate processing of the wood after delivery by floating, rail, or truck. However, the extensive floating in spring and summer makes this impossible in the northern countries and requires the establishment of large wood yards for pulpwood storage. Following a short survey of

the various storage defects, their origin, and their importance, the author considers the different methods of storing pulpwood and their effect on the possible protection of timber against decay and discoloration. Pulpwood in lengths of six feet and more is often floated to the mill in bundles and, with the aid of hoists and cranes, can be stored on land in bundles in large piles, whereas shorter pulpwood is preferably stored in stacks. Damage from rot can be avoided by either keeping the timber so moistened with water that the rot fungi cannot exist or by drying at the maximum rate. The former method is recommended for timber stored in stacks where air circulation is practically nonexistent, whereas the latter method is suitable for longer timber. The piles, as far as possible, must be built facing the principal wind direction, with sufficiently wide lanes in relation to the height of the piles; the ground must be well drained, free from vegetation, and preferably on a slope to ensure good circulation of air. The method of storing chips in large heaps deserves attention, particularly for the manufacture of sulfate pulp; it presents an extremely inexpensive solution to the problem and is technically easy to solve. As barking methods are improved, chips will undoubtedly play an increasingly important part as raw material for the chemical pulp industry. Experience has shown that the storage of chips in large piles does not adversely affect the quality of the resulting kraft pulp. Submerged storage of pulpwood might present the most desirable solution to the problem. Wet pulpwood, as a rule, gives a more uniform quality and a better pulp yield than pulpwood of varying moisture content. If it is stored in bundles under water, valuable storage space on land can be saved, and transportation can be simplified and made less expensive. However, to avoid discoloration the wood must be free of bark, which requires mechanized barking equipment at the place of bundling. Since the barking costs constitute half of the Finnish logging costs, a satisfactory solution of mechanized barking is imperative. 2 illustrations. E.S.

WOOD OPERATIONS

ANON. Columbia Cellulose woods operations. Pulp Paper Mag. Can. 52, no. 7: 160-5 (June, 1951).

The limits, forest management, logging areas, river driving, road construction, equipment, and personnel of the company in northwest British Columbia are described; it is the first large sustained-yield logging program under a B.C. forest-management license. 1 map and 11 illustrations of the operations. E.S.

CANADIAN PULP and PAPER ASSOCIATION. *Woodlands Section. Committee on Training of Woods Labor and Personnel.* Training of woods supervisory personnel. Symposium. Pulp Paper Mag. Can. 52, no. 7: 166, 169-70, 172, 174, 176 (June, 1951).

The following papers were presented at the symposium and are listed by authors and titles: Stewart, A. M. Status of supervisory training in the woods, p. 166, 169; Tait, John. Supervisory training from the foreman's point of view, p. 169; Crête, John-Paul. Training the contractor's supervisory personnel, p. 170; Bennett, W. D. The clerk's role, p. 170, 172; Cain, M. V. Comments on Training Committee's plan for supervisory training, p. 172, 174; McCann, J. A. Government training programs, p. 174, 176. E.S.

MCLEOD, NORMAN W. Pavements for logging roads. Pulp Paper Mag. Can. 52, no. 7: 178, 180, 183 (June, 1951); *cf.* B.I.P.C. 19: 283.

The author discusses the fundamental principles involved in the design and

construction of a firm unyielding road foundation and the two types of asphalt pavements serviceable for logging roads, the road-mix, and the plant-mix type. For the paving of logging roads, the plant-mix type is preferable in general. The economic advantages resulting from paving the main hauling roads are stressed. 1 table and 1 diagram. E.S.

WOOD ROOM

ANON. Woodmill addition at Camas. Pulp & Paper 25, no. 8: 82, 84 (July, 1951).

A brief description of the new wood mill of Crown Zellerbach Corp. at Camas is given, a part of which is still under construction. When finished, large and small log-barking and -chipping facilities will be available. Two new chip silos are under construction, and two additional ones are planned for the storage of chips purchased from nearby sawmills and plywood plants. 1 illustration and 1 map. E.S.

FARLEY, WILLIAM F. Wood handling and chip servicing at Camas. Paper Mill News 74, no. 31: 18, 20 (August 4, 1951).

The author describes the way in which the wood is received, prepared, and delivered to the pulp mill in the new woodroom of the Camas mill of Crown Zellerbach, where eight types of wood are received in bundle rafts, 8-foot logs by rail, farmer wood (8-, 16-, or 20-foot logs) by truck, and chips in rail boxcars. The experience with various methods of wood handling, chip storage, chip screening, and chip delivery is discussed. The operation of the new wood mill is outlined, including one hydraulic barker and a 153-inch whole-log chipper; a 30-inch ring barker and a 107-inch multiple chipper are still under construction. E.S.

WOOD TRANSPORTATION

MAGILL, W. A. Developments in trailer design. Pulp Paper Mag. Can. 52, no. 6: 136, 138-9 (May, 1951).

Some of the fundamentals in trailer design are discussed, and several types which are representative of present-day equipment and which have been found to be best suited for pulpwood hauling are described. M.W.

YEAST

HARRIS, ELWIN E., HAJNY, GEORGE J., and JOHNSON, MARTHA C. Protein evaluations of yeast grown on wood hydrolyzate. Ind. Eng. Chem. 43, no. 7: 1593-6 (July, 1951).

This project was undertaken to determine the conditions of maximum growth of six strains of fast-growing yeast, using wood hydrolyzate as a source of sugar, and the comparative value of yeasts as a source of protein for animals. All six strains of yeast grew rapidly on the wood hydrolyzate in a continuous propagator, using 90 to 96% of the reducing matter in solution, and gave yields of 42 to 58% of yeast with 45 to 51% protein. These six strains of yeast, plus a sample of yeast grown on spent sulfite liquor, were fed in comparison with casein as a source of protein to protein-depleted adult rats. Regain in weight with the eight strains of yeast was less than with casein, but when supplemented with methionine, weight regain with yeast was equal to casein. Wood hydrolyzate may be used as a source of sugar for the production of high yields of yeast which is high in protein. This low-cost yeast, when supplemented with small amounts of methionine, provides a source of protein comparable with animal proteins, thereby bringing about a rapid, low-cost, efficient method of converting waste nonedible carbohydrates into an edible complete protein. 4 tables and 15 references. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

BARNHART, PHILIP S., and MILLER, JOHN C. Cement for laminating sheets of paper or like materials. U. S. patent 2,560,916. Filed Sept. 8, 1945. Issued July 17, 1951. 2 claims. Assigned to Westfield River Paper Company, Inc. [Cl. 260-27]

A cement which is designed for use in the lamination of paper sheets contains more than 50% of a microcrystalline wax and 0.5-20% of a plasticizer. The cement includes a viscosity controller which comprises 1-25% of polyisobutylene (based on the total weight of cement) and a resin compatible with microcrystalline wax, selected from the group consisting of rosin, polymerized rosin, hydrogenated rosin, and the ethylene glycol esters of rosin. The cement is characterized by its ability to maintain effective viscosity when subjected to sealing temperatures up to 300°F. E.G.S.

ALKALINE PROCESSES—FURNACES

WILCOXSON, LESLIE S. Fluid heating apparatus. Canadian patent 474,548. Filed Feb. 7, 1948. Issued June 19, 1951. 9 claims. Assigned to The Babcock & Wilcox Company.

A black liquor recovery furnace incorporates a special nose baffle which is constructed and arranged below the vapor superheater to shield the superheater tubes from direct furnace radiation and to deflect the normal vertical flow of heating gases to a circuitous path upward and through an open fluid-cooled furnace pass. Thus it is possible to obtain a uniform distribution of heating gases transversely across the superheater, to maintain safe tube-metal temperatures, and to prolong the life of the superheater. 4 figures. E.G.S.

ALPHA PULP

LIMERICK, JACK M. Methods of removing hemi-cellulose from wood pulp. Canadian patent 474,715. Filed Aug. 30, 1947. Issued June 26, 1951. 4 claims.

A multistage, continuous process for the treatment of wood pulp is designed to provide an 80% yield (based on the weight of pulp treated) of an end product which contains more than 96% α-cellulose and which is suitable for use in the manufacture of clear cellulose acetate. The process comprises the consecutive steps of providing a 3-5% slurry of pulp in alkaline treating liquor; diluting the slurry to a pulp consistency of approximately 1% by the addition of alkaline treating liquor; thickening the slurry to a consistency of about 6-12%, while simultaneously displacing the initial liquor with a second, stronger alkaline liquor; diluting the slurry to a 3-5% pulp consistency by the addition of more of the second liquor; advancing the thus diluted slurry continuously along a closed, predetermined path for 15-60 minutes; repeating all of the above steps in three to four stages, using increasingly stronger liquors (from the thickening step of the next succeeding stage) for the final dilution step in each stage; continuously removing a predetermined portion of liquor from one of the early stages; continuously adding an equivalent amount of fresh liquor at the final dilution step of the last stage; and regulating the removal of spent liquor to maintain the concentration of hemicellulose in the liquors below 5%. The dilution steps are carried out under agitation, so as to break up localized concentrations of dissolved hemicellulose adjacent to the individual pulp fibers. 4 figures. E.G.S.

ANTI-STICKS

RYAN, VICTOR A., KESLER, WILLIAM C., and PIMPER, CHARLES W., JR. Closures. U. S. patent 2,554,639. Filed Nov. 1, 1948. Issued May 29, 1951. 2 claims. Assigned to Crown Cork & Seal Company, Inc. [Cl. 215-40]

Antisticking properties are imparted to a paper liner for metal bottle caps by the addition to the headbox of a 12% aqueous polymerizable solution of urea (or melamine) and formaldehyde. 4 figures. E.G.S.

BLEACHING

BURLING, ELMER R., and RICH, JOHN P. Methods and apparatus for chemical steeping of fibrous or pulverulent materials. Canadian patent 474,682. Filed April 6, 1949. Issued June 26, 1951. 10 claims.

This is the same as U. S. patent 2,516,447; *cf.* B.I.P.C. 20: 916. E.G.S.

STEELE, WILLIAM R., and SAWENS, RUSSEL H. Method of preparing parchmentized paper dialytic membranes. U. S. patent 2,558,064. Filed Aug. 14, 1947. Issued June 26, 1951. 5 claims. Assigned to Allied Chemical & Dye Corporation. [Cl. 8-119]

A method is described for the treatment of a sulfuric acid-parchmentized paper dialytic membrane which is adapted for use in the dialysis of used mercerizing liquor containing about 40% sodium hydroxide and contaminated with cellulosic impurities. The untensed parchmentized membrane is soaked in a 20-30% aqueous sodium hydroxide solution for 1-24 hours at 20-40°C.; the soaked parchment is rinsed with water for at least 0.5 hour at 10-60°; and the rinsed sheet is maintained wet until the time of dialysis. E.G.S.

BOARD, BUILDING

CAMP, THOMAS P. Process of producing water-repellent gypsum sheathing board. U. S. patent 2,560,521. Filed May 10, 1946. Is-

sued July 10, 1951. 3 claims. Assigned to United States Gypsum Company. [Cl. 154-86]

A water-repellent, gypsum sheathing board is provided with water-resistant, rosin-sized, petrolatum-coated paper liners and an intermediate paraffin-impregnated gypsum core. E.G.S.

BOARD, INSULATING

AYERS, OSBORN. Method of manufacturing structural insulation. U. S. patent 2,554,934. Filed Nov. 2, 1945. Issued May 29, 1951. 3 claims. Assigned to Johns-Manville Corporation. [Cl. 92-21]

A method is described for the manufacture of a low-density, high-strength asbestos insulating board which incorporates small stoichiometric amounts of sodium silicate and calcium chloride as a binder. About 1-10% (dry silica equivalent, based on the dry weight of the product) of sodium silicate is included in the original molding mixture. E.G.S.

BOARD SPECIALTIES

AKERS, VICTOR. Single sheet shirt protector. U. S. patent 2,560,710. Filed Aug. 20, 1948. Issued July 17, 1951. 2 claims. [Cl. 223-71]

A unitary cardboard shirt protector incorporates an integral collar-supporting element. 10 figures. E.G.S.

BOLTON, PHILIP S., and AID, JOSEPH J. Pallet. U. S. patent 2,559,930. Filed Oct. 22, 1946. Issued July 10, 1951. 2 claims. Assigned to Robert Gair Company, Inc. [Cl. 248-120]

A support for palletized loads comprises rectangular hollow tubes which are built up of several layers of paper tightly bonded together, and rectangular inserts which are arranged to fit tightly into the ends of the tubes. The inserts consist of hollow paper tubes which are arranged with their axes at right angles to the axis of the tube into which they are fitted. 8 figures. E.G.S.

CALDER, CAESAR A. Collar support and method of making same. U. S. patent 2,560,684. Filed Dec. 17, 1949. Issued July 17, 1951. 14 claims. [Cl. 223-83]

A collar support for a laundered shirt is reinforced by a thin metal wire which is laminated between strips of paper and cardboard. 14 figures. E.G.S.

CHAPMAN, ROMAINE C., and BOROWY, WILLIAM W. Snap fastener display card. U. S. patent 2,560,932. Filed Dec. 2, 1948. Issued July 17, 1951. 8 claims. Assigned to Scovill Manufacturing Company. [Cl. 206-80]

A cardboard display card on which complemental snap fastener elements are uniformly arranged is provided with a separate, detachable bag which contains the attaching members for securing the fastener elements to a garment. 5 figures. E.G.S.

CURRIE, GROVER C. Carton for cylindrical objects. U. S. patent 2,559,948. Filed Aug. 2, 1949. Issued July 10, 1951. 5 claims. Assigned to Dacam Corporation. [Cl. 224-45]

A collapsible cardboard carrier for cans of soup, fruit juice, beer, and the like is provided with several semicircular cutaway portions at the junction of the top panels and bottom flaps with the side walls; upon the insertion of several cans, the carrier bulges outwardly at each cutaway portion to cause the side walls to frictionally engage the cans against accidental dislodgment. 5 figures. E.G.S.

DERMAN, HARRY. Knockdown desk. U. S. patent 2,558,209. Filed Dec. 9, 1947. Issued June 26, 1951. 11 claims. [Cl. 312-195]

The top and side panels of a knockdown desk are constructed of two plies of corrugated board and are supported by a wooden reinforcing frame. 5 figures. E.G.S.

DUNNING, ROBERT M. Container. U. S. patent 2,558,940. Filed May 16, 1946. Issued July 3, 1951. 7 claims. Assigned to Waldorf Paper Products Company. [Cl. 229-52]

A container for bottled goods (e.g., beer, carbonated water, and the like) is provided with a clip secured to each end wall above the handhold to present a wide surface which may be engaged by the hands in carrying the case. 9 figures. E.G.S.

FALLERT, CLIFFORD D. Garment container. U. S. patent 2,561,053. Filed June 11, 1949. Issued July 17, 1951. 9 claims. Assigned to Gaylord Container Corporation. [Cl. 206-7]

A one-piece, folded-blank paperboard garment container incorporates top-forming portions which provide a strong, rigid support for a large number of garment hangers. 7 figures. E.G.S.

LEBOLD, SAMUEL N. Bottle carrier. U. S. patent 2,558,618. Filed Jan. 8, 1948. Issued June 26, 1951. 5 claims. Assigned to Morris Paper Mills. [Cl. 229-52]

A paperboard bottle carrier incorporates integral reinforcing elements which can be folded to an operative reinforcing position underlying the apex of a pair of side panels of the carrier; the elements are adapted to receive the supporting lugs of a bail-type wire handle. 9 figures. E.G.S.

MANNERVIK, CARL O. L. Shirt holder. U. S. patent 2,560,298. Filed May 23, 1946. Issued July 10, 1951. 4 claims. [Cl. 223-71]

A cardboard shirt holder incorporates a support for the neck band or collar, as well as stay strips over which the sleeves are folded. 5 figures. E.G.S.

PALMER, FRANK D. Collapsible receptacles. Canadian patent 474,830. Filed July 5, 1948. Issued June 26, 1951. 1 claim. Assigned to Frank D. Palmer, Inc.

A traylike paperboard receptacle incorporates corner-locking tabs in the end panels which are designed to co-operate with slits in the side panels. The end panels include extensions which are attached along the upper edges of the panels and which are folded over a portion of the packaged articles. 2 figures. E.G.S.

RINGLER, WILLIAM A. Carrier with interlocking partition elements. U. S. patent 2,559,374. Filed May 7, 1949. Issued July 3,

1951. 4 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-28]

A boxboard bottle carrier is fully partitioned transversely and longitudinally so that all bottles are maintained in individual cells. 19 figures. E.G.S.

TOMARIN, HARRY A. Garment support. U. S. patent 2,559,096. Filed Sept. 25, 1946. Issued July 3, 1951. 4 claims. Assigned to Loroco Industries Incorporated. [Cl. 223-85; changed to 223-87]

A cardboard garment support is adapted for attachment to a standard wire hanger for supporting the skirt portion of evening gowns, negligees, and other similar garments. 8 figures. E.G.S.

UBER, JAY J. Paper impregnating or saturating composition. U. S. patent 2,558,634. Filed Feb. 9, 1949. Issued June 26, 1951. 5 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 117-155]

A method for the preparation of stock for shoe midsoles, counters, and the like comprises the steps of mixing 1-9 parts of rubber in latex form with 1 part of a water-soluble sodium salt of lignin; precipitating free uncoagulated lignin from the mixture by the addition of 80-360% of ammonium sulfate, based on the weight of caustic soda used to dissolve the lignin; impregnating a wet paper web with the dispersion; and heating the impregnated web until the lignin is precipitated as free colloidal lignin, and ammonia is driven off. E.G.S.

WEISS, ARTHUR J. Spool. U. S. patent 2,559,056. Filed Jan. 30, 1947. Issued July 3, 1951. 10 claims. Assigned to Robert Gair Company, Inc. [Cl. 242-119]

A folding spool for holding tape, cord, wire, and the like is constructed of a single piece of paperboard without the use of wooden members. The spool may be shipped flat and set up and stapled together when ready for use. 13 figures. E.G.S.

WELSHENBACH, CHARLES D. Golf club box. U. S. patent 2,559,552. Filed Sept. 22, 1949. Issued July 3, 1951. 7 claims. Assigned to The Hinde & Dauch Paper Company. [Cl. 206-65]

A shipping and display receptacle for a set of golf clubs is provided with an interior display rack in the form of a paperboard strip which is bent to form intermediate ribs and end stops which are constructed with longitudinally aligned club handle-receiving recesses. 11 figures. E.G.S.

WILLIAMSON, MARSHALL I. Bottle carrier. U. S. patents 2,558,712-4. Filed Dec. 24, 1949. Issued June 26, 1951. 4, 4, and 9 claims. Assigned to National Folding Box Company, Inc. [Cl. 224-48]

A paperboard bottle carrier is equipped with a detachable strap handle which is constructed of a single ply of kraft paperboard, in which the grain preferably runs lengthwise of the handle. The strap may optionally be formed from a laminated stock of paper and fabric. 13, 10, and 12 figures. E.G.S.

WILLIAMSON, MARSHALL I. Multicompartment folding carton. U. S. patent 2,558,715. Filed April 21, 1950. Issued June 26, 1951.

7 claims. Assigned to National Folding Box Company, Inc. [Cl. 224-48]

A multicompartment paperboard bottle carrier embodies individual cells or pockets which are formed by webs extending between the side walls of the carrier. The web structure serves to provide circular or polygonal cells which are adapted to grip snugly a bottle or can. 13 figures. E.G.S.

WOLF, FREDERICK W. Collapsible advertising device. U. S. patent 2,559,489. Filed July 1, 1949. Issued July 3, 1951. 3 claims. [Cl. 40-126]

A cardboard display easel is designed for the apparent three-dimensional exhibition of an article (e.g., a bottled beverage) which is preferably illustrated in perspective on the front face of the easel. 6 figures. E.G.S.

WOLF, FREDERICK W. Self-supporting advertising or display device. U. S. patent 2,559,488. Filed March 18, 1949. Issued July 3, 1951. 8 claims. [Cl. 211-72]

A self-supporting cardboard display easel affords automatic movement of the display portions of a poster out of the plane of the latter when the device is set up for use. 6 figures. E.G.S.

CAUSTICIZING AND RE-CAUSTICIZING

WALKER, ROBERT S. Method of and means for producing milk of lime and for causticizing green liquor. U. S. patent 2,560,016. Filed Jan. 5, 1948. Issued July 10, 1951. 4 claims. Assigned to Traylor Engineering & Manufacturing Company. [Cl. 23-188]

Means are provided for greatly increasing the output of a rotary slaker of a given size; the lime and slaking liquid are preliminarily mixed ahead of the slaker, so that the operation need not be performed in the slaker proper, with the result that the material may be fed through the slaker more rapidly. When the slaker is used as a classifier in the causticization of green liquor, it is possible to produce a very dense, fine particle form in the resulting product, which consists of slaked lime, calcium carbonate, and other solids. The fine particles settle very quickly and may be centrifuged from the white liquor. 2 figures. E.G.S.

CHEMICAL TESTING—WATER—CHLORINE

WALLACE, CHARLES F. Method of determining the concentration of a chemical constituent of a fluid. U. S. patent 2,560,317. Filed Feb. 27, 1946. Issued July 10, 1951. 8 claims. Assigned to Wallace & Tiernan Products, Inc. [Cl. 23-230]

A method is described for the determination of the relative concentrations of chlorine in chlorinated and untreated streams. Means are included for the automatic control of the rate of feed of chlorine, which are responsive to the comparative analytical tests of the two streams; this control is preferably effected by means of a two-compartment potential cell. 4 figures. E.G.S.

DISPENSING CONTAINERS

ANTUNEZ-PONS, LYDIA. Containers for balls, skeins, hanks or the

like of thread or other materials. Canadian patent 474,689. Filed Feb. 6, 1948. Issued June 26, 1951. 3 claims.

A cardboard container for balls, skeins, or hanks of thread includes dispensing openings for the withdrawal of thread without the necessity of opening the container. The carton is enclosed in a transparent wrapper. 4 figures. E.G.S.

GIESSEN, NORMAN D. Wedge-shaped dispensing containers for powdery substances. Canadian patent 474,705. Filed May 28, 1948. Issued June 26, 1951. 7 claims.

A wedge-shaped cardboard dispensing container is adapted for the packaging of light, powdery materials, such as insecticide powders. 7 figures. E.G.S.

NEUBECK, GUSTAVE A. Dispensing container with measuring extension outlets. U. S. patent 2,554,050. Filed Dec. 17, 1948. Issued May 22, 1951. 3 claims. [Cl. 222-23; changed to 222-26]

A paper bag which is designed for the packaging of coffee, tobacco, lard, and similar materials incorporates a measuring device for dispensing a predetermined portion of the contents from the bag. The measuring feature comprises a pair of flattened tubular extensions which project from the top of the bag. 3 figures. E.G.S.

FOLDING BOXES

FRANKENSTEIN, WILLIAM P. Cartons. Canadian patent 474,612. Filed May 21, 1948. Issued June 19, 1951. 13 claims. Assigned to Patented Packages.

This is the same as U. S. patent 2,529,147; *cf.* B.I.P.C. 21: 283-4. E.G.S.

FRANKENSTEIN, WILLIAM P. Cartons. Canadian patent 474,614. Filed Aug. 7, 1948. Issued June 19, 1951. 14 claims. Assigned to Patented Packages.

A carton of the break-back lid type is formed from a single blank in such a manner that all printing can be done on the side of the blank which is to be exposed on the setup carton. 12 figures. E.G.S.

ZINN, JULIUS A., JR. Lined carton. U. S. patent 2,558,918. Filed July 2, 1948. Issued July 3, 1951. 5 claims. [Cl. 229-14; changed to 229-37]

A lined cardboard carton which is adapted for the packaging of fine-grain or liquid material may be readily assembled without rupturing the adhesion between the outer wall and the liner. 4 figures. E.G.S.

INTERIOR PACKING

ALFREDS, TORRIS H. Egg packing material. U. S. patent 2,560,402. Filed Dec. 7, 1946. Issued July 10, 1951. 5 claims. Assigned to Mapes Consolidated Manufacturing Company. [Cl. 217-34]

A molded-pulp packaging material is adapted for insertion between two of the solid walls of an egg case and the adjacent end strips of the cellular filler

in the desired layers of packed eggs, to limit the bending and prevent the subsequent collapse of the tips which project outwardly from the end strips toward the walls, and thereby prevent the strips from engaging or contacting the walls. 3 figures. E.G.S.

YAUPP, DANIEL M. Packing swing. U. S. patent 2,561,260. Filed Oct. 28, 1947. Issued July 17, 1951. 3 claims. [Cl. 229-42]

A cardboard or paperboard packing swing is adapted for use in conjunction with a shipping carton for radios, dishes, and the like. 4 figures. E.G.S.

LIGNIN

WATSON, WILLIAM H. Diene polymerizations terminated with lignin. Canadian patent 473,836. Filed April 28, 1948. Issued May 22, 1951. 5 claims. Assigned to Polymer Corporation Limited.

A process for the emulsion polymerization of butadiene in admixture with styrene includes the addition to the reaction mixture of an aqueous solution which contains about 1.5 parts by weight of lignin per 100 parts of monomer to terminate the polymerization reaction. E.G.S.

WATSON, WILLIAM H. Lignin-stabilized diene polymers. Canadian patent 473,835. Filed April 28, 1948. Issued May 22, 1951. 8 claims. Assigned to Polymer Corporation Limited.

A stabilized copolymer of butadiene and styrene contains as the stabilizing agent about 0.5-1.5 parts by weight of lignin per 100 parts by weight of the copolymer. E.G.S.

MACHINERY—CONVERTING MACHINERY

BACK, LEONARD. Apparatus for setting up cartons. U. S. patent 2,560,405. Filed March 30, 1949. Issued July 10, 1951. 18 claims. Assigned to The Interstate Folding Box Company. [Cl. 93-51]

An apparatus which is adapted for the erection of one-piece frozen food cartons includes means for insuring the positioning of folded corner-connecting webs inside the erected carton and lying against predetermined walls, so as not to interfere with the filling operation. 19 figures. E.G.S.

CHAPLIN, MERLE P. Pulp molding machine. U. S. patent 2,559,945. Filed Nov. 1, 1946. Issued July 10, 1951. 9 claims. Assigned to Chaplin Corporation. [Cl. 92-56; changed to 92-57]

A pulp-molding machine incorporates stepping and locking mechanisms which operate in conjunction with forming and drying dies. 17 figures. E.G.S.

GRUPE, WILLIAM F., and BAMFORD, ARTHUR P. Machine for and method of manufacturing valve bags. U. S. patent 2,559,873. Filed Oct. 19, 1944. Issued July 10, 1951. 12 claims. Assigned to Arkell & Smiths. [Cl. 93-8]

A machine is adapted for the manufacture of multi-ply valve bags of the type in which a filling sleeve extends through the valve opening; the mechanism is adjustable to produce bags of various sizes. 18 figures. E.G.S.

HOWARD, STANLEY R. Apparatus for producing filled bags.

Canadian patent 474,839. Filed Dec. 6, 1948. Issued June 26, 1951. 11 claims. Assigned to Pneumatic Scale Corporation, Limited.

This is the same as U. S. patent 2,457,237; *cf.* B.I.P.C. 19: 447. E.G.S.

KUCKLINSKY, FRED W. Coating apparatus for wrapping and cartoning machines. U. S. patent 2,553,592. Filed March 19, 1947. Issued May 22, 1951. 14 claims. Assigned to Esther M. Kucklinsky. [Cl. 91-49]

An internally supplied glue applicator roller may be arranged to provide for skip-gap or surface pattern application to the surface of material (e.g., a carton or package) with which the roller is engaged. 12 figures. E.G.S.

MUENCH, CARL G. Apparatus for the manufacture of brick siding. U. S. patent 2,559,543. Filed July 10, 1948. Issued July 3, 1951. 7 claims. Assigned to The Celotex Corporation. [Cl. 91-43]

An apparatus is adapted for the application of a variegated pattern coating to sheets of insulating brick siding. 4 figures. E.G.S.

PALMER, CHARLES E. Container forming apparatus. Canadian patent 474,831. Filed Dec. 6, 1948. Issued June 26, 1951. 7 claims. Assigned to Frank D. Palmer, Inc.

A mechanism is adapted for use in the formation of the paperboard tray-type container or a box with a hinged cover; means are included for effecting the engagement of locking elements to hold the container structure in a setup condition. 9 figures. E.G.S.

MACHINERY—JORDANS

STUCK, HAROLD D. Jordan engine plug construction. Canadian patent 474,762. Filed Nov. 16, 1948. Issued June 26, 1951. 14 claims. Assigned to John W. Bolton & Sons, Inc.

A strong, lightweight jordan plug is described in which the major parts of the castings forming the outer or supporting body are replaced by an outer, hollow, truncated conical jacket which has longitudinal grooves in which plug bars can be fixed. The jacket is constructed of stainless steel or bronze conical sections which are welded together to form the curved outer member of the plug. The body of the plug includes end hubs which comprise light disks connected by a metal tube. 14 figures. E.G.S.

STUCK, HAROLD D. Method of making linings for jordan engines. U. S. patent 2,561,999. Filed March 4, 1946. Issued July 24, 1951. 2 claims. Assigned to John W. Bolton & Sons, Inc. [Cl. 92-27]

A moldable plastic material is used as a separator between the knives of a jordan shell or the bars of a plug. The composition is prepared by mixing quickly one pound of 50-R Haveg alkali-resistant cement and 15 g. of phenol-formaldehyde resin; adding three pounds of 41-R Haveg acid-resistant cement and 37 ml. of sulfuric acid solution, more or less as is necessary to control the expansion of the mass; and, while mixing rapidly, adding 6 g. of sisal fiber cut about one inch long and 6 g. of steel wool, preferably 4 g. of stainless steel wool and 2 g. of ordinary steel wool cut about one-half inch long. The material should be mixed and applied at 60-90°F., and in hot weather it should be used immediately after mixing. 5 figures. E.G.S.

MACHINERY—PACKAGING MACHINERY

PALMER, FRANK D. Box making, filling, and closing apparatus. U. S. patent 2,558,456. Filed April 22, 1948. Issued June 26, 1951. 17 claims. Assigned to Package Machinery Company. [Cl. 93-55.1]

A method and apparatus are adapted for the packaging of dry powdered, granular, liquid, or semiliquid materials. The machine is supplied with tubular box bodies in collapsed or flattened condition and with stacks of end-closure blanks; it operates to form the blanks into flanged end closures and to insert and seal the closures in the opposite ends of the container body. 31 figures. E.G.S.

MACHINERY—SLITTERS AND WINDERS

MILLER, CLARENCE W. Variable diameter winder shaft. U. S. patent 2,558,689. Filed March 5, 1948. Issued June 26, 1951. 2 claims. Assigned to D. J. Murray Manufacturing Co. [Cl. 242-72]

A variable-diameter, collapsible paper roll arbor is adapted to coact with cylindrical roll cores of various diameters in such a manner that the circular shape of the cores is maintained, regardless of the size of the cores. 7 figures. E.G.S.

MACHINERY—SUCTION ROLLS

HEYS, RALPH C. Paper-making machines. Canadian patent 474,550. Filed March 11, 1948. Issued June 19, 1951. 8 claims. Assigned to Beloit Iron Works.

The sheet transferred from the wire of a papermaking machine is led to a suction roll operating with at least two press rolls which rest on the suction roll and exert pressure by their own weight. The suction roll is provided with a suction compartment for each press roll. The adherence of the wet sheet to the first press roll is prevented by the use of an endless felt which is carried between the nip of the press roll and the suction roll and led away from the nip by being carried around the press roll itself. 6 figures. E.G.S.

WAY, THOMAS H. Suction press rolls. Canadian patent 474,573. Filed Nov. 12, 1949. Issued June 19, 1951. 13 claims. Assigned to Dominion Rubber Company, Limited.

A strong bond is obtained between the soft rubber cover and the cylindrical bronze shell of a suction press roll by the process of threading the surface of the shell to form integral upstanding screw threads which have straight side walls on their outer portions and straight tops; knurling the outer surface of the shell, thereby widening or mushrooming the outer ends of the threads so that the end portions are wider than the shank portions; simultaneously knurling the end portions transversely; spraying a thin coating of stainless steel (e.g., 18-8) over the outer surface of the shell; applying a rubber cover over the coated shell; and vulcanizing the cover in place. 7 figures. E.G.S.

MACHINERY—THICKENERS

COGHILL, JAMES T., and LANGDON, HOWARD H. Apparatus for thickening pulp. U. S. patent 2,561,013. Filed Sept. 6, 1947. Issued July 17, 1951. 20 claims. Assigned to Consolidated Machine Tool Corporation. [Cl. 92-26]

A pulp thickener is designed to dewater pulp rapidly and efficiently from consistencies of 2-4% to 10-35%. The pulp is handled in such a manner that the unit is self-clearing and self-cleaning with respect to the drainage surface. 13 figures. E.G.S.

METERS AND RECORDERS

SENEY, JOHN S. Moisture indicator for webs. U. S. patent 2,558,392. Filed May 14, 1949. Issued June 26, 1951. 3 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 161-1]

A moisture indicator for a traveling textile web is adapted for the continuous measurement of the electrical resistance of a portion of the web (e.g., the thread sheet of the slasher), which in turn is a function of its moisture content. The entire thread sheet of the slasher is passed between a pair of stainless steel rolls located behind the last drier can. The rolls are connected in an electrical circuit with a condenser which is successively charged and discharged at a rate dependent upon the electrical resistance of the portion of the thread sheet extending between the rolls. An electrical counter is provided for counting the number of times the condenser is charged and discharged during a predetermined period of time; this number is a measure of the total moisture content. The indicator can also be adapted for use with a running web of cellophane or other cellulosic material. 7 figures. E.G.S.

MOLDED PULP ARTICLES

CHAPLIN, MERLE P. Molded fiber article. U. S. patent 2,560,847. Filed June 3, 1947. Issued July 17, 1951. 8 claims. Assigned to Chaplin Corporation. [Cl. 229-2.5]

A molded-pulp egg carton embodies cross-bracing ribs which serve to reinforce the carton walls transversely against externally applied crushing pressure. 29 figures. E.G.S.

HEYMANN, ROY D. Hunters' decoys. Canadian patent 474,748. Filed Feb. 13, 1948. Issued June 26, 1951. 17 claims. Assigned to Animal Trap Company of America.

This is the same as U. S. patent 2,495,721; *cf.* B.I.P.C. 20: 535. E.G.S.

RISCH, ARTHUR H. Molded pulp corner protector. U. S. patent 2,560,249. Filed Dec. 23, 1948. Issued July 10, 1951. 3 claims. Assigned to Pulp Reproduction Company. [Cl. 206-46]

A hollow, unitary, boxlike, corner-protecting pad which is formed from molded pulp has resilient moisture- and heat-resistant walls. 6 figures. E.G.S.

PACKAGING

BAGGS, ROBERT N. Container for resistors or the like. U. S. patent 2,558,920. Filed Nov. 28, 1947. Issued July 3, 1951. 4 claims. Assigned to International Resistance Company. [Cl. 206-46]

A paper container or envelope is designed for the packaging of fixed radio resistors or the like. 5 figures. E.G.S.

BERKSON, MAURICE J. Packaging folder for snap fasteners. U. S.

patent 2,560,520. Filed Jan. 13, 1949. Issued July 10, 1951. 1 claim. Assigned to Columbia Fastener Company. [Cl. 218-28]

A paper folder for snap fasteners is formed from an elongated sheet which is divided into sections by transverse folds; the folds are arranged to permit the holder to be folded into a compact package. 5 figures. E.G.S.

HAHN, DOUGLAS. Hosiery package. U. S. patent 2,561,112. Filed Dec. 4, 1947. Issued July 17, 1951. 2 claims. Assigned to B. Altman & Co. [Cl. 206-46; changed to 206-45.31]

A compact package for women's hosiery comprises a sheet of bond paper around which a pair of hose is folded, a sheet of cellulose acetate which is wound together with the folded hose and paper sheet to form a tight roll, and an outer cylindrical container which is formed of 0.005-inch cellulose acetate sheeting and which is designed to receive the tightly wound roll. 14 figures. E.G.S.

HEINEMAN, RUTH T., and MILLER, JOHN F. Modeling clay package. U. S. patent 2,558,650. Filed April 19, 1947. Issued June 26, 1951. 4 claims. Miller's interest assigned to Heineman. [Cl. 206-46]

A circular metal container for the packaging of modeling clay incorporates a metal foil or oil-treated boxboard liner which will not adhere to the container. After an imprint has been made in the clay, the liner and clay can be removed for further processing. 3 figures. E.G.S.

WOOL, FRANK A. Frozen food package. U. S. patent 2,559,101. Filed Aug. 13, 1945. Issued July 3, 1951. 6 claims. [Cl. 99-171]

A waxed cardboard container for frozen food (e.g., pears, peaches, grapes, cherries, and the like) is constructed with concentric inner and outer tubular walls and is sealed at the opposite ends by identical flanged annular heads. 15 figures. E.G.S.

PAPER—COATED

FAEBER, HARRY W. Method of coating continuous webs of paper or the like. U. S. patent 2,555,536. Filed Nov. 17, 1948. Issued June 5, 1951. 8 claims. Assigned to Time, Inc. [Cl. 117-152; changed to 117-111]

A method is described for the application of several layers of coating material to a paper web, successively and in relatively close adjacent stations to the web as it passes through the coating material. The process is adapted to be carried out on the coating apparatus which is covered by U. S. patent 2,456,495 (*cf.* B.I.P.C. 19: 371). 4 figures. E.G.S.

HAYWOOD, GERALD, and DAYTON, CHARLES S. Method of coating paper. U. S. patent 2,560,572. Filed June 25, 1946. Issued July 17, 1951. 3 claims. Assigned to West Virginia Pulp and Paper Company. [Cl. 117-111]

A method is described for the coating of book and magazine paper. The coating color is applied between a pair of cylinders, one of which is deformable to a limited degree, and the other of which is nonyielding, rigid, and of a smaller radius of curvature. An enlarged contact zone is created between the two cylindrical surfaces, and the color is subjected to shear, with

the result that a film of uniform thickness and reduced viscosity is delivered from between the rolls. Immediately upon application to the base stock, the color sets because of the removal of the shearing force and the abstraction of water from the color by the base stock. The freshly coated sheet is initially subjected to slow drying prior to its entry into the regular drier section of the Fourdrinier machine; thus an excessively rapid removal of moisture from the coated sheet is prevented. 7 figures. E.G.S.

PORTER, LAURENCE W., and JEWETT, FRANK H., II. Process for the production of paper coating adhesives. U. S. patent 2,555,057. Filed Dec. 10, 1947. Issued May 29, 1951. 10 claims. Assigned to S. D. Warren Company. [Cl. 260-17.3]

A process is described for the preparation of a water-resistant paper-coating composition. As an example, 0.63 part of soda ash and 84 parts of a water-soluble melamine-formaldehyde reaction product are added to a mixture of 520 parts of water and 280 parts of tapioca or cassava starch which has been converted by treatment with 1.68 parts of a liquefying enzyme. The mixture is stirred and heated to 205°F. for 10 minutes. The pH of the reacted mixture is 7.2. The mixture is immediately cooled and diluted with 415 parts of water, and 200 parts of coating-grade calcium carbonate is stirred in until free from lumps. Then 800 parts of coating clay is added, dispersed in 430 parts of water; the pH of the coating composition is 7.4. The coating is applied by means of squeeze rolls to both sides of a sized paper body stock, and the coated paper is dried and supercalendered. The product is very resistant to wet-rub and is satisfactory for lithographic printing. E.G.S.

SCHEID, LOUIS J. Coating for paper and method of production. U. S. patent 2,559,901. Filed Feb. 6, 1947. Issued July 10, 1951. 8 claims. Assigned to Watervliet Paper Company. [Cl. 106-154]

A paper coating solution has the following composition: 50 parts of clay, 36.6 parts of water, and 79.4 parts of an enzyme-converted soybean flour solution. The carbohydrate content of the soybean flour is previously solubilized by mixing 210 parts of water, 45 parts of flour, and 0.1 part of Amyliq (an amylolytic enzyme manufactured by Wallerstein Co., Inc.); allowing the enzyme to act on the flour for 60 minutes at 120°F.; adding 45 parts of a 5% caustic solution; holding the resultant solution for 30 minutes at 120°; and then straining to give a final solution which contains 15 parts (purchase weight) of soybean flour per 100 parts of solution. It is claimed that improved surface characteristics (e.g., color, smoothness, gloss, and ink receptivity) are obtained in the coated paper. E.G.S.

PAPER—COATED (HOT-MELT)

COWGILL, WILLIAM W. Method of glossing paper. U. S. patent 2,554,663. Filed Dec. 15, 1949. Issued May 29, 1951. 7 claims. Assigned to United States Rubber Company. [Cl. 117-65]

A high-speed process is described for the glossing of paper with a thermoplastic resin coating; as an example, a normally hard, inelastic resinous copolymer of 85% styrene and 15% butadiene, which has a second-order transition temperature of 63°C., is applied in an aqueous dispersion to a smooth, calendered paper surface in the ratio of about 1.5 lb. of resin to 1000 sq. ft. of paper. The coated paper is dried, and the coating is set by immediate heating at 100°C. for about 35 seconds. The coated, dried paper is glossed by continuous passage into the nip of the chromium-plated, mirror-

finished iron roll and a hard cotton roll at a pressure of approximately 400 p.s.i. in the nip and with the surface of the iron roll heated to 140°C. The paper is held in contact with the glossing roll for 180° and stripped hot from the roll. 3 figures. E.G.S.

PAPER—COATED (WRINKLE COATING)

WALDIE, WILLIAM A. Flexible oil acid modified alkyd resin wrinkle coating composition and method of making. U. S. patent 2,556,606. Filed March 12, 1946. Issued June 12, 1951. 4 claims. Assigned to New Wrinkle, Inc. [Cl. 260-22]

A flexible wrinkle-coating composition comprises the reaction product of approximately 15 parts of glycerin, 15-40 parts of phthalic anhydride, 10-30 parts of castor oil acids, 15-30 parts of drying oil, an oil-soluble drier (e.g., cobalt linoleate), and a solvent (e.g., butanol). All compositions are given by weight. E.G.S.

PAPER SPECIALTIES

ALLEN, HOWARD G. Tobacco pouch. U. S. patent 2,560,535. Filed March 5, 1946. Issued July 17, 1951. 2 claims. Assigned to American Machine & Foundry Company. [Cl. 229-76]

A flexible tobacco pouch which is constructed of cellophane, rubber hydrochloride, or coated or uncoated paper may be opened neatly without the mutilation of the pouch walls. 9 figures. E.G.S.

AMBERG, WALTER E. Paper cup and handle therefor. U. S. patent 2,558,287. Filed Nov. 19, 1945. Issued June 26, 1951. 5 claims. Assigned to Lily-Tulip Cup Corporation. [Cl. 229-52]

A handle for a double-wrapped paper cup is either adhesively attached to the wall of the cup or formed as an integral part of the outer wrapping of the cup. 14 figures. E.G.S.

BRECHNER, HYMAN. Combination manifold form and envelope. U. S. patent 2,558,813. Filed Dec. 20, 1948. Issued July 3, 1951. 10 claims. [Cl. 282-25]

A combination business form and envelope is constructed in such a manner that duplicate copies of matter written on the business form may be obtained on an integral portion of the combination. 6 figures. E.G.S.

BUTTERY, KENNETH T., and SUTHERLAND, LOUIS W., JR. Handled cup or like receptacle. U. S. patent 2,560,927. Filed April 16, 1947. Issued July 17, 1951. 6 claims. Assigned to Sutherland Paper Company. [Cl. 229-4.5]

A paper cup or receptacle is provided with a handle which may be collapsed against the side of the cup to permit nesting or may be swung to an erected position for grasping. 5 figures. E.G.S.

CATLIN, JOHN B., and WOLLWAGE, JOHN C. Filter materials and process for making such materials. U. S. patent 2,554,814. Filed May 21, 1945. Issued May 29, 1951. 9 claims. Assigned to Paper Patents Company. [Cl. 154-138]

A filter element for a lubricating oil filter or the like is formed of several plies of creped tissue which has been impregnated with a water-soluble, thermosetting phenol-formaldehyde resin. E.G.S.

CRANE, SIGMUND. Diaper. U. S. patent 2,560,332. Filed Aug. 17, 1950. Issued July 10, 1951. 6 claims. [Cl. 128-287]

A disposable diaper consists of an inner liner of soft, bonded, unwoven fibers, an intermediate, moisture-absorbent pad of fluffed alpha pulp, and an outer liner of waterproof material (e.g., polyethylene, latex, or the like). 4 figures. E.G.S.

EBEL, CLARENCE J. Pressure-sensitive adhesive and adhesive tape. U. S. patent 2,553,816. Filed Feb. 16, 1948. Issued May 22, 1951. 10 claims. Assigned to Minnesota Mining & Manufacturing Company. [Cl. 117-122; changed to 206-59]

A pressure-sensitive adhesive tape comprises a paper, cloth, or nonfibrous film backing which is coated with the following eucohesive composition: 100 parts of a rubbery acrylate copolymer which is prepared from 75 parts of 2-ethylbutyl acrylate and 25 parts of ethyl acrylate, copolymerized in aqueous dispersion, and coagulated with alum; 5 parts of titanium dioxide pigment; 5 parts of a phenol-aldehyde resin which is prepared from approximately two moles of formaldehyde and one mole of *p-tert*-amylphenol; 10 parts of ester gum; 1 part of zinc resinate; 300 parts of heptane; and 6 parts of ethyl alcohol. E.G.S.

EHRLICH, JOSEPH R. Multicolor carbon paper. U. S. patent 2,559,608. Filed Nov. 26, 1948. Issued July 10, 1951. 5 claims. [Cl. 282-28]

A multicolor carbon paper yields copies, the color of which can be altered by chemical treatment. For example, if an inert red lake is used as the pigment of the carbon paper in combination with a fat-soluble organic black dyestuff or a neutral black mixture of fat-soluble purple, green, and yellow dyestuffs in such proportion that the combination of red pigment and black dye appears black, a carbon paper is obtained which resembles ordinary black carbon paper and yields black copies. However, the black copies can be changed to red by contact with a strong oxidizing agent (e.g., aqueous solutions of sodium hypochlorite, or potassium permanganate followed by oxalic acid). E.G.S.

FRANCIS, CARLETON S., JR. Transfer and method of coating therewith. U. S. patent 2,556,078. Filed May 18, 1945. Issued June 5, 1951. 5 claims. Assigned to American Viscose Corporation. [Cl. 154-95]

A flexible transfer sheet comprises a paper backing which carries a permanent coating of phenol-formaldehyde resin and a temporary coating of vinyl resin over the permanent coating; the temporary coating separates readily from the permanent coating after the adhesion of the former to another material. 4 figures. E.G.S.

FROST, FREDERICK H. Planographic printing plate and treatment thereof. U. S. patent 2,559,610. Filed Dec. 12, 1947. Issued July 10, 1951. 5 claims. Assigned to S. D. Warren Company. [Cl. 101-149.2]

A process for the manufacture of a paper-base planographic printing plate which has a hydrophilic printing surface comprises the incorporation into the surface prior to the preparation of the image on the plate of a water-soluble compound (e.g., ammonium phosphate, oxalate, sulfate, borate, or citrate) capable of reacting with a water-soluble metal salt (e.g., zinc acetate or formate, or barium chloride) to precipitate a water-insoluble compound of the metal. E.G.S.

KOHL, WILLIAM R. Window device for garment bags and like containers. U. S. patent 2,558,904. Filed Aug. 8, 1947. Issued July 3, 1951. 9 claims. [Cl. 206-45.31]

An inspection window device for a paper garment-storage bag effects a lapped, lightproof sealing closure of a window in the bag. 10 figures. E.G.S.

LARZELERE, SAMUEL R. Combined letter sheet and return postal card or envelope. U. S. patent 2,559,776. Filed June 23, 1950. Issued July 10, 1951. 2 claims. [Cl. 229-92.1]

A return postal card or envelope is associated with an advertising letter sheet in such a manner that the card or envelope is removably supported by the sheet in a convenient, conspicuous position for delivery; the name and address of the addressee indicated on the card or envelope serves as the address head of the letter sheet. 5 figures. E.G.S.

NESTOR, LEONARD R. Starch adhesive sheet material and composition therefor. U. S. patent 2,559,043. Filed Nov. 26, 1947. Issued July 3, 1951. 7 claims. Assigned to Minnesota Mining & Manufacturing Company. [Cl. 106-213]

A gummed paper tape is coated with the following adhesive composition: 37.9% water, 6.8% sodium hypochlorite solution, 46.1% potato starch, and 9.2% sodium hydroxide solution (50%). E.G.S.

SHERRY, LOUISE A. Liquid container with extensible spout. U. S. patent 2,559,202. Filed April 14, 1949. Issued July 3, 1951. 2 claims. [Cl. 229-7]

A waxed paper milk and cream container embodies an extensible pouring spout. 3 figures. E.G.S.

STEARN, JOHN T. Process of treating paper. U. S. patent 2,559,234. Filed Feb. 16, 1945. Issued July 3, 1951. 1 claim. [Cl. 117-155]

A process for improving the dimensional stability of paper comprises the steps of preparing a solution of 1.5-2.0 moles of formaldehyde and 1 mole of thiourea, aging the solution at a pH of 4-6 to secure partial reaction without the formation of insoluble products, impregnating a paper web with the partially reacted solution at a pH of 2-3, and heating the paper to dry it and to cure an insoluble resin on the individual paper fibers. The heating is continued until there is no appreciable quantity of soluble reaction product, acid, or formaldehyde in the paper. The resultant product is suitable for use as tabulating board, map paper, or template stock. E.G.S.

ZISKA, ADAM. Cup for refrigerated commodities. U. S. patent 2,561,262. Filed May 31, 1946. Issued July 17, 1951. 4 claims. Assigned to Samuel M. Kaufman. [Cl. 229-5.5]

The bottom of a paper ice cream cup is provided with a single central projection which furnishes the sole contact with the cover of a similar cup stacked below it; the projection extends a predetermined distance below the lowermost edge of the bottom rim. 4 figures. E.G.S.

PLYWOOD

BOEHM, ROBERT M. Process of making a plywood product. U. S. patent 2,557,071. Filed Oct. 12, 1945. Issued June 19, 1951. 5 claims. Assigned to Masonite Corporation. [Cl. 154-133]

A process for the manufacture of plywood from wood veneers comprises the steps of subjecting the veneers to a hydrolysis treatment in the presence of steam at 200-1000 p.s.i. so as to activate the natural bonding materials of the wood; drying the veneers to lower their moisture content substantially; arranging a number of veneers in a stack; subjecting the stack to heat and pressure to obtain a flow of the activated bonding material between the plies; and chilling the stack under pressure. E.G.S.

PURIFIED WOOD FIBER

MARTIN, MERVIN E., and SHERK, DANIEL L. Purification of cellulosic materials. U. S. patent 2,558,054. Filed March 16, 1949. Issued June 26, 1951. 2 claims. Assigned to Celanese Corporation of America. [Cl. 8-105]

A sulfite pulp is subjected to an initial alkali cook, which may optionally be omitted, then chlorinated, and given another alkali cook at a temperature above 160°C. The pulp is also bleached at some point in the process. It is claimed that the second cook serves to reduce materially the pentosan content of the pulp. 1 figure. E.G.S.

RAYON—VISCOSE PROCESS

CALHOUN, JOHN A., JR. Production of cellulose xanthate. U. S. patent 2,558,038. Filed Nov. 23, 1946. Issued June 26, 1951. 9 claims. Assigned to American Viscose Corporation. [Cl. 260-216]

In a process for the manufacture of cellulose xanthate the admixture of alkali cellulose and atomized carbon disulfide is accomplished by the exposure of the ingredients to the action of high-frequency (i.e., 1000 to several billion cycles per second) sonic radiation. 2 figures. E.G.S.

CALHOUN, JOHN A., JR., and WEDLER, FREDERICK C. Viscose production. U. S. patent 2,558,037. Filed Aug. 21, 1946. Issued June 26, 1951. 2 claims. Assigned to American Viscose Corporation. [Cl. 260-217; changed to 260-218]

A process for the manufacture of viscose includes the steps of subjecting a mass which comprises at least some undissolved cellulose xanthate and aqueous sodium hydroxide to high-frequency (i.e., 1000-1,000,000 cycles per second) sound waves until a smooth, substantially homogeneous viscose is obtained which has a viscosity approximating the minimum value reached during normal storage for aging; and then storing the viscose without agitation until its viscosity has risen to that value at which the viscose is to be formed into shaped articles. 3 figures. E.G.S.

KLEINERT, THEODOR. Process for treating of cellulose material. U. S. patent 2,560,391. Filed Nov. 14, 1947. Issued July 10, 1951.

8 claims. Assigned to Lenzinger Zellwolle- und Papierfabrik Aktiengesellschaft. [Cl. 260-212]

A process is adapted for the breakdown of alkali cellulose by oxidation, for the purpose of its conversion into cellulose derivatives, particularly viscose. A suspension is prepared which contains 16-24% by weight of sodium hydroxide and 3-6% by weight of alkali cellulose fibers, and particles of the suspension are thrown into an air space above the suspension by a series of perforated beater plates or disks in order to obtain increased contact between the suspension and the air. 5 figures. E.G.S.

WEDLER, FREDERICK C. Production of alkali cellulose. U. S. patent 2,558,066. Filed Aug. 21, 1946. Issued June 26, 1951. 7 claims. Assigned to American Viscose Corporation. [Cl. 260-233]

A method of producing alkali cellulose of substantially uniform composition comprises the preparation of a pulp slurry in an aqueous alkali solution, the passage of the slurry through a field of sound waves which have a frequency of 1000-1,000,000 cycles per second, and the subsequent removal of the impregnated pulp as such from the field. 3 figures. E.G.S.

ROOFING FELTS

CROCE, MICHELE. Structural covering material. U. S. patent 2,554,089. Filed June 28, 1946. Issued May 22, 1951. 2 claims. Assigned to Certain-Teed Products Corporation. [Cl. 117-140]

A roofing felt comprises a resin-impregnated sheet of felted fibrous material. The resin includes the portion of the resinous material of southern longleaf pine which is soluble in benzene and in furfural but insoluble in naphtha, and a pressure tar asphalt which has a penetration value at 115°F. of 5-50 and a softening point of 150-225°. Each ingredient constitutes 25-75% by weight of the impregnating material. E.G.S.

SHIPPING CONTAINERS

POWELL, HENRY K. Cartons. Canadian patent 474,613. Filed June 11, 1948. Issued June 19, 1951. 7 claims. Assigned to Samuel F. Jones, Chesley L. Jones, and Mervyn H. Jones, doing business as Patented Packages.

A shipping and display carton for clocks, dolls, household appliances, and the like includes a separately insertable platform which is adapted for use in conjunction with a bottom member of the carton. A shouldered, recessed cover member carries a supporting cushion element to protect fragile articles during storage and shipment. 9 figures. E.G.S.

RUSHING, FRED L., and WILLIAMS, BENJAMIN M. Container having cover locking means. U. S. patent 2,559,320. Filed March 14, 1946. Issued July 3, 1951. 2 claims. Assigned to Gaylord Container Corporation. [Cl. 229-43]

A corrugated shipping carton incorporates a slip cover which automatically locks to the body without the use of separate fastening members. 11 figures. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

BRADY, CHARLES V., and OTTINGER, AUGUST F. Valved bag. U. S. patent 2,558,169. Filed Sept. 24, 1948. Issued June 26, 1951. 9 claims. Assigned to Bemis Bro. Bag Company. [Cl. 150-9]

A textile or paper-lined textile valve bag incorporates an insert-type valve sleeve. 16 figures. E.G.S.

STRAW

DREYFUS, HENRY. Manufacture of cellulose. U. S. patent 2,560,638. Filed Oct. 3, 1945. Issued July 17, 1951. 8 claims. Assigned to Celanese Corporation of America. [Cl. 92-16]

A process is described for the manufacture of cellulose from straw. As an example, the straw is chopped, screened free from dust, and cooked with 10 times its weight of a 1% sodium hydroxide solution for an hour. The straw is then filtered, washed free from alkali, further mechanically disintegrated, and dried. The dried, pretreated material is boiled under reflux for five hours with 10 times its original weight of 90% ethyl alcohol containing 1% of hydrochloric acid. The mixture is cooled, and the product is filtered off, washed thoroughly with 90% ethyl alcohol and then with water, and boiled for an hour with a 1% sodium hydroxide solution, in an amount 10 times the original weight of the straw. The product is filtered off, washed until free from alkali, and bleached with calcium hypochlorite. At this point the material consists mainly of cellulose, contaminated with pentosans and other hemicelluloses, but contains little or no lignin. The crude cellulose is subjected to the following treatment to remove the greater portion of the hemicelluloses. The material is boiled under reflux with 0.5% hydrochloric acid for about one hour, filtered, and washed until neutral. It is agitated for one hour with a 12% aqueous sodium hydroxide solution, filtered, washed, boiled with a 0.5% sodium hydroxide solution, filtered, and washed. Finally it is bleached with a small amount of calcium hypochlorite, washed first with dilute acid and then with water, and dried. E.G.S.

SULFITE WASTE LIQUOR

VLOEBERGHS, ANTOINE. Briquetted fuel and process of manufacture. Canadian patent 474,730. Filed Dec. 29, 1947. Issued June 26, 1951. 7 claims. [In French]

As an example, a briquetted fuel is formed from finely divided anthracite coal which has been treated with 4-8% of an asphalt emulsion, 4-8% of spent sulfite liquor, and 0.5-4% of sodium silicate. 3 figures. E.G.S.

TALL OIL

STEPHENSON, RAYMOND W. Process for making tall oil. U. S. patent 2,561,150. Filed Sept. 3, 1948. Issued July 17, 1951. 14 claims. Assigned to Kirby Chemical Company, Inc. [Cl. 260-97.7]

A process for the production of refined tall oil from sulfate soap skimmings comprises the steps of floating the soap on a 30% aqueous sulfuric acid solution; applying heat by the direct injection of 50-100 p.s.i. steam into the acid solution; continuing the heating until the tall oil formed has an acid number of at least 170; and separating the tall oil. E.G.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

OLIVER, RALPH R. Flame resistant cellulose fibrous materials and method of making same. U. S. patent 2,553,781. Filed April 14, 1950. Issued May 22, 1951. 2 claims. Assigned to Lockport Cotton Batting Co. [Cl. 117-137]

Loose, unspun, unwoven cotton or other vegetable fibers are rendered

flame- and flash-resistant by treatment in a bath of borax, boric acid, and a suitable anionic or nonionic surface-active agent (e.g., an alkylaryl sulfonate, the dioctyl ester of sodium sulfosuccinic acid, polymerized ethylene oxide, a sulfated fatty alcohol, the alkali soap of naphthenic acid, or quaternary ammonium salts). E.G.S.

TRANSPARENT CONTAINERS

BERGSTEIN, ROBERT M. Knocked down or folding structure made from acetate sheeting or the like. U. S. patent 2,551,090. Filed Sept. 6, 1946. Issued May 1, 1951. 3 claims. Assigned to Robert M. Bergstein and Frank D. Bergstein. [Cl. 229-41]

A method is described for the formation of flexible or hinged joints between adjoining panels of paperboard sheeting which is used in the construction of knocked-down containers. 34 figures. E.G.S.

WET STRENGTH

LEHR, JAMES C., O'FLYNN, DENIS J., and TOMPSON, READE Y. Urea-formaldehyde paper-treating compositions. U. S. patent 2,557,299. Filed March 9, 1950. Issued June 19, 1951. 14 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-29.4]

A high-wet strength paper is produced by the addition at the beater or vat of 0.5-2.0% (based on the dry weight of the paper) of a diglycolic acid-modified urea-formaldehyde condensation product. E.G.S.

MAXWELL, CHARLES S., and LANDES, CHESTER G. Manufacture of cellulose products of improved wet strength. U. S. patent 2,559,220. Filed July 31, 1942. Issued July 3, 1951. 7 claims. Assigned to American Cyanamid Company. [Cl. 92-3]

A paper stock is treated with a cationic melamine-formaldehyde resin which has the property of selective absorption or adsorption on the cellulosic fibers, so that substantial amounts of resin sufficient to impart improved wet strength to the paper can be applied to the fibers from a relatively dilute resin solution. The process is particularly applicable for use in the manufacture of writing paper, wrapping paper, newsprint, toweling, boxboard, and the like. E.G.S.

MAXWELL, CHARLES S., and LANDES, CHESTER G. Manufacture of wet strength paper. U. S. patent 2,559,221. Filed June 28, 1947. Issued July 3, 1951. 5 claims. Assigned to American Cyanamid Company. [Cl. 92-21]

This corresponds to Canadian patent 461,848; *cf.* B.I.P.C. 20:378. E.G.S.

AUTHOR INDEX TO BOOKS

American Chemical Society. *Division of Medicinal Chemistry* 831
Barry, J. K. 831
Fabel, K., ed. 832
Imperial Chemical Industries Limited. *Dyestuffs Division* 831
Jackson, L., ed. 831
Jacobus, D. L., comp. 831
Kertesz, Z. I. 832
Kirchner, U., ed. 832
Kollmann, F. 832
Longsworth, L. G. 831
New York Academy of Sciences 831
Special Libraries Association. *Science-Technology Division* 831
Suter, C. M., ed. 831
U. S. Tariff Commission 831
Van der Werth, A., comp. 832
Verein der Zellstoff- und Papier-Chemiker und -Ingenieure 832

AUTHOR INDEX TO ABSTRACTS

The letter P preceding a page number indicates a patent abstract.

Aid, J. J. ..... P 887
Akers, V. ..... P 887
Alexander, R. R. 847
Alfreds, T. H. ..... P 891
Allen, H. G. ..... P 898
Allen, J. W. 847
Allen, R. J. L. 867
Allied Chemical & Dye Corporation . P 886
Altman, B., & Co. ..... P 896
Amberg, W. E. ..... P 898
American Cyamid Company ..... P 904
American Machine & Foundry Company ..... P 898
American Standards Association ... 841
American Viscose Corporation ..... P 899, P 901, P 902
Animal Trap Company of America .. P 895
Antunez-Pons, L. ..... P 890
Arkell & Smiths ..... P 892
Ayers, O. ..... P 887
The Babcock & Wilcox Company ... P 885
Back, L. ..... P 892
Baggs, R. N. ..... P 895
Bakelite Company 860
Baker, B. E. 877
Baker, T. T. 869
Baldwin, H. I. 847
Bamford, A. P. ..... P 892
Barnhart, P. S. ..... P 885
Basberg, A. 857
Beckett, W. 871
Beckman, N. J. 865
Beloit Iron Works ..... P 894
Bemis Bro. Bag Company ..... P 902
Bennett, W. D. 883
Bergstein, F. D. ..... P 904
Bergstein, R. M. ..... P 904
Berkson, M. J. ..... P 895
Bishop, F. F. 877
Block, S. S. 849
Boehm, R. M. ..... P 901
Bolton, J. W. & Sons, Inc. ..... P 893
Bolton, P. S. ..... P 887
Booth, R. J. 841
Borders, A. M. 880
Borowy, W. W. ..... P 887
Boxboard Containers 851
Bradford, E. A. M. 858
Brady, C. V. ..... P 902
Brandberg, A. 848
Brechner, H. ..... P 898
Brecht, W. 843, 866
Breyman, E. A. 855
Brounstein, C. J. 850
Brown, J. 854
Brown, L. 833
Buckman, S. J. 873
Burling, E. R. ..... P 886
Buttery, K. T. ..... K 898
Cain, M. V. 883
Calder, C. A. ..... P 887
Calhoun, J. A., Jr. ..... P 901
Calvert, M. A. 839
Cameron Machine Company 855
Camp, T. P. ..... P 886
Canadian Chemical Processing 878
Canadian Pulp and Paper Association. *Woodlands Section. Committee on Training of Woods Labor and Personnel* 883
Cassidy, R. T. 851
Catlin, J. B. ..... P 898
Celanese Corporation of America .. .. P 901, P 903
The Celotex Corporation ..... P 893
Certain-Teed Products Corporation . P 902
Chaplin, M. P. ..... P 892, P 895
Chaplin Corporation ..... P 892, P 895
Chapman, R. C. ..... P 887
Chemical Engineering 878
Chittenden, A. E. 857
Christenson, T. 841
Clark, J. d'A. 845
Clark, N. O. 841
The Clark-Aiken Company 852
Clibbens, D. A. 839
Coghill, J. T. ..... P 894
Columbia Fastener Company ..... P 896
Consolidated Machine Tool Corporation ..... P 894
Coomber, H. E. 857
Couch, R. de S. 863
Cowgill, W. W. ..... P 897
Craig, F. A. 860
Crane, S. ..... P 899
Crête, J-P. 883
Croce, M. ..... P 902
Crown Cork & Seal Company, Inc. . P 886
Currie, G. C. ..... P 887
Curtis, J. S. 862
Cutro, J. 852
Cyrus, W. F. 869
Dacam Corporation ..... P 887
Dappen, J. W. 859
Day, F. T. 864, 878
Dayton, C. S. ..... P 896
Derman, H. ..... P 888
Dominion Rubber Company, Limited . P 894
Dreyfus, H. ..... P 903
Dunning, R. M. ..... P 888
du Pont de Nemours, E. I., & Company ..... P 889, P 895, P 904
Ebel, C. J. ..... P 899
Eberhardt, L. E. 854
Ehrlich, J. R. ..... P 899
Engelmann, H. 834
Erickson, D. R. 860
Evans, J. C. W. 875
Faeber, H. W. ..... P 896
Fagg, E. 863
Fallert, C. D. ..... P 888
Farley, W. F. 884
Field, G. E. 871
Fortune, T. M. 875
Francis, C. S., Jr. ..... P 899
Frankenstein, W. P. ..... P 891
Franklin, J. N. 870

Freeport Sulphur Company 878
Freudenberg, K. 849
Frost, F. H. .....P 899
Fyfe, T. 845
Gair, Robert, Company, Inc. .P 887, P 889
Gallagher, W. C. 836
The Gardner Board and Carton Co. .P 889
Gaylord Container Corporation P 888, P 902
Geffken, C. F. 868
Gehrke, G. 849
Geisler, W. 872
General Aniline & Film Corporation . 858
Giessen, N. D. .....P 891
Gilmour, W. A. 854
Goettsch, W. 852
Goodison, D. 873
The Goodyear Tire & Rubber Company of Canada, Limited 855
Görnhardt, L. 879
Gottlieb, S. 850
Gow, J. T. 856
Graff, R. M. 833
Griffith, F. T. 848
Groendyk, J. 872
Grupe, W. F. .....P 892
Gustafsson, C. 840
Hahn, D. .....P 896
Hajny, G. J. 884
Hansen, G. E. 847
Hansen, O. 880
Hare, J. H. 877
Harris, E. E. 884
Harrison, V. G. W. 866
Hart, J. S. 876
Hayward, A. M. 839
Haywood, G. .....P 896
Hedlund, I. 835
Heermance, E. L. 847
Heimberger, W. 849
Heineman, R. T. .....P 896
Heinrich, H. H., Inc. 853
Henington, V. 873
Hertzmark, E. M. 873
Hescock, M. A. 834
Heymann, R. D. .....P 895
Heys, R. C. .....P 894
Higginbotham, R. S. 873
Hilbert, G. E. 874
Hill, L. E. 855
The Hinde & Dauch Paper Company P 889
Hitchin, D. F. 862
Hobson, P. N. 874
Hodge, J. E. 874
Hokenson, L. N. 872
Holliday, P. 833
Honstead, J. F. 877
Horio, M. 864
Horlock, A. B. 875
Hormel, G. A., & Company 858
Howard, S. R. .....P 892
Hudson, W. G. 855
Hughes, F. P. 864
International Resistance Company ...P 895
The Interstate Folding Box Company P 892
Ivarsson, B. 868
Jayme, G. 838
Jensen, W. 871
Jewett, F. H., II .....P 897
Johansson, O. S. 868
Johns-Manville Corporation .....P 887
Johnson, M. 835
Johnson, M. C. 884
Johnsson, H. 835
Jones, C. L. .....P 902
Jones, M. H. .....P 902
Jones, S. F. .....P 902
Juell, F. 854
Karjala, S. A. 874
Kaufman, S. M. .....P 900
Kesler, W. C. .....P 886
Kirby Chemical Company, Inc. .....P 903
Kleinert, T. .....P 901
Knott, R. B. 842
Kohl, W. R. .....P 900
Körner, L. 843, 866
Kotte, H. 867
Kraft, R. 849
Kramer, M. G. 838
Kropf, V. J. 852
Kucklinsky, E. M. .....P 893
Kucklinsky, F. W. .....P 893
Lafontaine, G. H. 846
Landes, C. G. .....P 904
Langdon, H. H. .....P 894
Larzelere, S. R. .....P 900
Lebold, S. N. .....P 888
Lehr, J. C. .....P 904
Lenz, E. C. 883
Lenzinger Zellwolle- und Papierfabrik Aktiengesellschaft .....P 902
Leontif, W. 844
Letts, W. W. 847
Levón, M. 846
Liebert, E. 866
Liiri, O. 856
Lily-Tulip Cup Corporation .....P 898
Limerick, J. M. .....P 885
Lockport Cotton Batting Co. .....P 903
Loroco Industries Incorporated .....P 889
Lytton, C. W. 879
McCann, J. A. 883
McGinn, E. P. 871
McLeod, N. W. 883
Magill, W. A. 884
Mannervik, C. O. L. .....P 888
Mapes Consolidated Manufacturing Company .....P 891
Martin, M. E. .....P 901
Masonite Corporation .....P 901
Maxwell, C. S. .....P 904
Melvin, T. S. F. 851
Michie, R. 869
Miller, C. W. .....P 894
Miller, E. C. 847
Miller, J. C. .....P 885
Miller, J. F. .....P 896
Miller, R. H. P. 847
Miller, R. N. 842
Miller-Lauffer Printing Equipment Corporation 853
Minnesota Mining & Manufacturing Company .....P 899, P 900
Modern Industry 844
Modern Packaging 858, 859
Moir, S. 846
Montgomery, A. E. 852
Moore, W. C. 872
Morris, C. V. 864, 865
Morris Paper Mills .....P 888
Muench, C. G. .....P 893
Muldoon, T. J. 859
Murdock, H. R. 846
Murray, D. J., Manufacturing Co. ..P 894
Nadell, H. H. 861
National Folding Box Company, Inc. .....P 889, P 890
Nekoosa-Edwards Paper Company . 846
Nemerow, N. 881
Nestor, L. R. .....P 900
Neubeck, G. A. .....P 891
New Wrinkle, Inc. .....P 898
Newcomb, D. 856
Northeastern Wood Utilization Council 847

O'Flynn, D. J. ..... P 904
Oliver, R. R. ..... P 903
Olsson, G. 848
Onogi, S. 864
Ottinger, A. F. ..... P 902
Packaging Machinery Company ..... P 894
Paine, F. A. 867
Palmer, C. E. ..... P 893
Palmer, F. D. ..... P 888, P 894
Palmer, F. D., Inc. ..... P 888, P 893
Paper and Paper Products 861
Paper Patents Company ..... P 898
Parker, L. T. 849
Partridge, H. E. 845
Patented Packages ..... P 891, P 902
Peat, S. 874
Pehrson, S. O. 842
Pelczar, M. J., Jr. 850
Pepper, J. M. 850
Perry, A. N. 875
Petrie, G. 854
Piipponen, H. 847
Pimper, C. W., Jr. ..... P 886
Pneumatic Scale Corporation, Limited P 893
Poljak, A. **839**
Polymer Corporation Limited ..... P 892
Porter, L. W. ..... P 897
Poulter, S. R. C. 866, 867
Powell, H. K. ..... P 902
Pöyhönen, K. 881
Proctor, B. E. 844
Pulp & Paper 871, 878
Pulp and Paper Magazine of Canada 847
Pulp Reproduction Company ..... P 895
Raney, W. P. 865
Rayon Or'ganon 870
Renner, M. S. 875
Rich, J. P. ..... P 886
Ringler, W. A. ..... P 888
Risch, A. H. ..... P 895
Robertson, W. E. 842
Ronkanen, A. J. 881
Root, C. 837
Royce, C. K. 859
Rushing, F. L. ..... P 902
Ryan, V. A. ..... P 886
Saarnio, J. 840
Sagoschen, J. A. 877
Saltford, G. W. 838
Sass, O. 837
Sawens, R. H. ..... P 886
Scheid, L. J. ..... P 897
Schoening, M. A. 839
Scovill Manufacturing Company .. P 887
Sears, G. R. 880
Seney, J. S. ..... P 895
Shaw, John, and Sons (Honley) Ltd. 855
Shea, J. R., Sr. 871
Shearer, D. A. 850
Shema, B. F. 852
Sherk, D. L. ..... P 901
Sherman, R. A. 836
Sherry, L. A. ..... P 900
Shold, K. M. 833
Shorter, A. H. 862
Sihtola, H. 882
Simmons, F. C. 847
Singh, C. 857
Smith, T. H. 840
Spiegel, Inc. 873
Stadler, Hurter & Company 852
Stearn, J. T. ..... P 900
Steele, W. R. ..... P 886
Stegmann, G. 835
Stenerson, H. 840
Stephenson, E. E., Jr. 874
Stephenson, R. W. ..... P 903
Stevenson, L. T. 861
Stewart, A. M. 883
Strapp, R. K. 876
Stuck, H. D. ..... P 893
Sundman, J. 840
Sutherland, D. G. 871
Sutherland, L. W., Jr. ..... P 898
Sutherland Paper Company ..... P 898
Sutlive, K. 862
Swanson, J. W. 880
Tait, J. 883
Technical Association of the Pulp and Paper Industry 837
Thomas, H. A. 844
Time, Inc. ..... P 896
Timgren, L. 853
Tock, W. T. 850
Tomarin, H. A. ..... P 889
Tompson, R. Y. ..... P 904
Traylor Engineering & Manufacturing Company ..... P 890
Trist, A. R. 860
Trotter, I. F. 833
Trump, J. G. 844
Turcotte, L. P. 847
Uber, J. J. ..... P 889
U. S. Department of Commerce. *Production and Marketing Administration* 859
United States Gypsum Company .... P 887
United States Rubber Company .... P 897
Vance, H. W. 834
Van den Heuvel, E. 864
Vander Meulen, C. R. 874
Van Nederveen, G. 834
Varis, T. 882
Vaughn, T. H. 838
Vloeberghs, A. ..... P 903
Voet, A. 868
Waldie, W. A. ..... P 898
Waldorf Paper Products Company .. P 888
Walker, R. S. ..... P 890
Wallace, C. F. ..... P 890
Wallace & Tiernan Products, Inc. .. P 890
Warren, S. D., Company ..... P 897, P 899
Wate, G. K. 876
Watervliet Paper Company ..... P 897
Watson, C. A. 870
Watson, W. H. ..... P 892
Way, T. H. ..... P 894
Wedler, F. C. ..... P 901, P 902
Wegelius, T. 882
Weiss, A. J. ..... P 889
Welshenbach, C. D. ..... P 889
West Virginia Pulp and Paper Company ..... P 896
Westfield River Paper Company, Inc. P 885
Wheeler, G. W. 880
Whelan, W. J. 874
Wichmann, A. 848
Wilcox, H. 837
Wilcox, J. M. 856
Wilcoxson, L. S. ..... P 885
Williams, B. M. ..... P 902
Williamson, M. I. ..... P 889
Wink, W. A. 865
Wolf, F. W. ..... P 890
Wolfe, W. F. 836
Wollwage, J. C. ..... P 898
Wool, F. A. ..... P 896
Wright, R. H. 839
Yaupp, D. M. ..... P 892
Zinn, J. A., Jr. ..... P 891
Ziska, A. ..... P 900

LIBRARY SERVICE

The Library of The Institute of Paper Chemistry is located in the Kimberly Memorial Building. Its purpose is to serve the students and the faculty of The Institute of Paper Chemistry and the chemists and technologists of the pulp and paper industry.

To contributing members it gives the following service:

A monthly bulletin is issued, listing all new books and periodicals added to the library and containing titles and abstracts of articles published during the previous month in the field of pulp and paper chemistry and technology. The annual index carries a list of periodicals currently received.

At a reasonable cost the librarian will furnish complete reference lists on chemical and technical problems for member mills, and will procure translations, photostats, or abstracts of the articles listed. Upon request, member mills working on special problems will be kept in touch with new publications related to their work.

Reviews of new publications pertaining to the field of pulp and papermaking will be included from time to time.

The library is open daily with the exception of Sundays from 8:15-5:00 and from 7:30-9:30. Saturday it closes at 5:00 o'clock.